

*the*  
*magazine*  
*of* **STANDARDS**



**STANDARDS FOR A DYNAMIC DECADE . . . page 357**

**Eleventh National  
Conference on  
Standards**

**APPLIED STANDARDIZATION . . . page 379**

**Standards Engineers Society  
Ninth Annual Meeting**

**DECEMBER 1960**

# the magazine of STANDARDS

Standardization is dynamic, not static. It means  
not to stand still, but to move forward together.

Vol. 31 No. 12 DECEMBER, 1960

## FEATURES

### The Eleventh National Conference on Standards

Opening Session. <i>Standards for a Dynamic Decade</i> .....	357
Session 2. <i>Policy Direction and Programming of the DoD</i> .....	359
Sponsor: Office of the Secretary of Defense	
Session 3. <i>Defense Standardization Operations</i> .....	360
Sponsor: Office of the Secretary of Defense	
Session 4. <i>How ASA Serves Company Standards Needs</i> .....	361
Sponsor: ASA Company Member Conference	
Session 5. <i>Creating Standards Programs in New Areas. Part I</i> ....	363
Sponsor: ASA Company Member Conference	
Session 6. <i>Creating Standards Programs in New Areas. Part II</i> ....	365
Sponsor: ASA Company Member Conference	
Session 7. <i>Value Analysis as a Basis of Standardization</i> .....	371
Sponsor: National Association of Purchasing Agents	
Session 8. <i>Quality Standards in Manufacturing</i> .....	372
Sponsors: American Society for Quality Control and the American Statistical Association	
Session 9. <i>The Executive Viewpoint on Standards</i> .....	374
Session 10. <i>Accomplishments, Developments, and Need for Standards Activities in the Building Industry</i> .....	376
Awards Luncheon .....	368
The Standards Medal and the Howard Coonley Medal .....	369
The Exhibits .....	367, 370
The Standards Engineers Society Annual Meeting .....	379

## DEPARTMENTS

### American Standards

Just Published .....	381
In Process .....	381

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ASA

### THE COVER:

Space ships, one symbol of the dynamic decade featured in the theme of the Eleventh National Conference on Standards, are the subject of this artist's sketch. Purpose of the sketch was to show how expandable fabrics might be used in space. A fabric space ship hovers in the background while the space ship at lower left takes off for the moon or Venus. The vehicle, center, has fabric solar heat collector, communications antennas, and bags for fuel and other liquid storage.



Goodyear  
Aircraft

Two national standards meetings, both held this Fall, are reported in this issue. These are the Eleventh National Conference on Standards sponsored by the American Standards Association (page 357) and the Ninth

## notes

Annual Meeting of the Standards Engineers Society (page 379). Both of these annual events are of high importance to the standards world; a recent comparison of the attendance lists shows that only a small number of the same individuals have attended both meetings in the past.

This year both the SES meeting and the National Conference emphasized the importance of standards in meeting competition from the growing industries and low-priced products of other countries, in helping to cut costs of production in the face of rising expenses, and in the new techniques of automation and use of electronic computers. The standardization program of the Department of Defense and industry's relation to it were also considered in each meeting.

Plans for next year's standards meetings (1961) were announced.

The Standards Engineers Society's 1961 Annual Meeting will be held at the Hotel Sherman, Chicago, September 18, 19, and 20. The theme will be "Standards—Cost Reduction."

The National Conference on Standards will be at the Rice Hotel, Houston, Texas, October 10, 11, and 12, 1961. H. C. Ball, Humble Oil & Refining Company, Baytown, Texas, is chairman of the program committee.

The Company Member Conference has selected the Pick-Congress Hotel, Chicago, June 1 and 2, for its Spring Meeting. B. Scott Liston, new CMC chairman, will not only have principal charge of the CMC program for the Spring Meeting but will also take an important part in the planning and arrangements for the Twelfth National Conference on Standards.

For information about the 1960 Proceedings, see pages 378 and 380.

# This Month's Standards Personality

Harry C. Plummer



**DIRECTOR OF ENGINEERING AND TECHNOLOGY** for the Structural Clay Products Institute since 1937, Harry C. Plummer has helped to found the Construction Specifications Institute, has written textbooks and articles, and has strongly supported standards in the building industry.

His contributions in the building field in promoting the use of standards by architects and engineers was recognized early this year by the American Society for Testing Materials, when the Society presented to him the ASTM Award of Merit. He has not only served for 22 years on various committees but has been a leader in the formulation of improved building codes for masonry construction in which the requirements for materials are covered by ASTM standards, the Society pointed out in announcing the award.

Since 1939, when he became a member of ASA Sectional Committee A62, Mr Plummer has taken an active interest in development of standards for "modular coordination" of building materials and equipment—the "modular method" as it is now widely known. He is vice-chairman of Committee A62 and a member of the Modular Building Standards Association, set up recently to promote the use of the modular method and development of standards for modular construction, equipment, and supplies. Mr Plummer is credited with being largely responsible for the fact that the clay products industry was the first building material manufacturer group to adopt modular sizes for its products.

After graduating from Ohio State University with a Bachelor of Arts degree and from Case Institute of Technology with a Bachelor of Science in civil engineering, Mr Plummer formed the Sterling Engineering Company in Cleveland and served as president and general manager of the firm until 1934. At that time he started his work with the clay products industry as chief engineer of the Brick Manufacturers Association in Cleveland. He has held his present position since 1937.

Mr Plummer is a Fellow of the American Ceramic Society and a member of Keramos, national ceramic honorary society. He is also a member of the American Society of Civil Engineers, the American Society for Testing Materials, and the Building Research Advisory Board.

His contributions to the literature of his field include the *Brick and Tile Engineering Handbook* and co-authorship of *Reinforced Brick Masonry and Lateral Force Design*. In addition, he has written numerous articles for technical publications.



UPI photo

J. H. Foote (center) displays the Howard Coonley Medal, presented to him at the Awards Luncheon (page 368). Looking on are Howard Coonley (left), in whose honor the medal was named, and John R. Townsend, president of the ASA.

Except where otherwise noted, photos taken at the National Conference on Standards are by Raimondo Borea.

THE DYNAMIC CHALLENGE facing standards during the coming decade, and the practical application of standards in company operations were emphasized in two national conferences on standards held this Fall.

"Standards for a Dynamic Decade" was the keynote of the Eleventh National Conference on Standards, held October 25-27 at the Sheraton-Atlantic Hotel, New York, and sponsored by the American Standards Association. A report of the conference is published on pages 357-378. Individually, the ten sessions were sponsored by the Office of the Secretary of Defense, ASA's Company Member Conference, the National Association of Purchasing Agents, American Society for Quality Control and American Statistical Association, and the Modular Building Standards Association.

Award of the Howard Coonley Medal and the Standards Medal is reported on page 369.

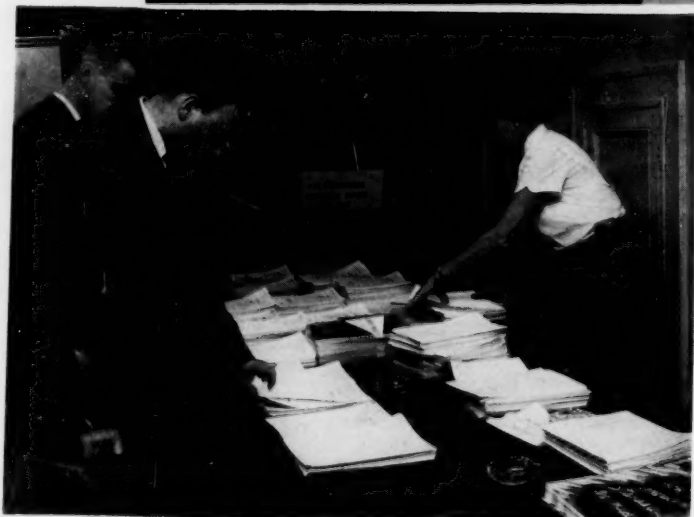
"Standardization Applied," was the theme of the annual meeting of the Standards Engineers Society, September 26-28, Hilton Hotel, Pittsburgh. The meeting is reported on pages 379-380.



UPI photo

**CENTER**—An original Eli Whitney musket, first example of interchangeable manufacture, is examined by Vice Admiral G. F. Hussey, Jr, ASA's managing director (holding the weapon), D. F. Schmit, vice-president, Radio Corporation of America (left), and W. A. Wildhack, special assistant, National Bureau of Standards (center). The musket was one of the items in the Department of Defense exhibit.

**RIGHT**—Copies of the papers, sold following each session, were in active demand.





# THE ELEVENTH NATIONAL CONFERENCE ON STANDARDS

ASA President John R. Townsend opens the Conference. Speakers, left to right, S. H. Watson, D. F. Schmit, Mr Townsend, Frank H. Roby, G. F. Hussey, Jr.



## SESSION 1. KEYNOTE — STANDARDS FOR A DYNAMIC DECADE

WITH AN APPEAL TO STANDARDS MEN to meet the challenge of the new environment created by research and development and the resulting new materials and methods, John R. Townsend, president of the American Standards Association, opened the Eleventh National Conference on Standards. Mr Townsend is special assistant to the Director of Research and Engineering, U.S. Department of Defense.

Today's new technologies need vast new standards projects, said D. F. Schmit in the keynote speech that set the theme for the conference. Mr Schmit is staff vice-president, product engineering, Radio Corporation of America. He referred to space technology, where precise measurement standards<sup>1</sup> are essential, as well as to electronic data processing, automation, and atomic power.

<sup>1</sup> NOTE: On October 14, the National Bureau of Standards announced adoption of a new, precise, international standard of length—a wavelength of light—replacing the meter bar. This action was taken by the Eleventh General Conference on Weights and Measures.



Mr Roby challenges industry to support standards.

These major technologies will make or break our economic growth, Mr Schmit declared, commenting that the vital question is whether our free enterprise system of voluntary standardization can rise to the challenge posed by the state-directed system of the Soviet Union.

"The Soviet Union, by edict, can establish within a very short time a single national standard for a vital electronic part needed in missile or commercial products development," he said. "In our system, there may be 10 or 20 different companies simultaneously developing different versions of the same type

of component. Our three military services, in addition, may be writing three different specifications for the same type of component. Several trade and professional organizations independently may then try to standardize this component within their own spheres. And, finally, they may try to come together under the auspices of the American Standards Association, our national voluntary coordinating body, to try to develop a single national standard."

However, Mr Schmit said, "I do not believe that in the long run the Russian system is as efficient as ours." Although it may achieve some fast, short-term results, he said, "it makes impossible the emergence



*A question from the floor for Mr Roby.*

of the most efficient end result through the process of test and elimination among the many competing variations."

Commenting that "no institution in our free society—be it political, economic, or social—can exist without constant vigilance and effort of all free individuals who make up this institution," he asked standards engineers to consider and discuss the following questions: "How can we make our voluntary standardization movement more active and effective to cope with the national and international challenges of the 60's? Do we as individuals and companies contribute enough to our national standardization movement? And do we have enough cooperative give-and-take to make voluntary standardization a tool of strength for our own companies and the entire nation?"

*Business success* is irrevocably tied in with effective standardization, Frank H. Roby, executive vice-president, Federal Pacific Electric Corporation, Newark, and vice-president, American Standards Association, declared. He referred to millions of dollars saved through use of American Standards. Indicating the importance and broad application of ASA work, he pointed particularly to the American Standard Drafting Manual, to safety standards which have cut industrial accident rates, new standards being developed for mobile homes and travel trailers, a project for development of a universal machine language for data processing used throughout science and industry, and standards work on nuclear instrumentation, electrical apparatus and systems used in nuclear industries, chemical engineering in the nuclear field, reactor safety, and radiation protection.

In addition, "Western Power defenses have already

been strengthened through adoption by the USA, Canada, and Great Britain of uniform screw thread standards which eliminate costly engineering conversions and simplify maintenance of equipment produced in one country but used in another," he said.

Considering only those projects mentioned, the United States could justify a national standardization effort through the American Standards Association costing millions, Mr Roby declared; ASA's 1960 budget is only \$706,474, "but it should have been about \$900,000 for the job to be done." "Obviously," Mr Roby commented, "some essential standardization activities had to be passed up because money wasn't available to cover their cost."

The cost to industry of an effective national and international standardization program would be less than \$5.00 per million dollars of sales if the burden were spread evenly across all the companies and industries which directly benefit, he said. A new plan prepared by ASA's Finance Committee would insure adequate funds without disproportionate burden on any one segment of industry, Mr Roby reported.

"Remember," Mr Roby told the conference, "the support ASA seeks from industry is essential to every individual, family, business, and community."

In his review of ASA's activities during the past year, Vice Admiral G. F. Hussey, Jr, USN (Ret), managing director of the American Standards Association, reported initiation of eight new projects: Shop-fabricated metal storage tanks, B86; Data processing machines, X3; Office machines, X4; Industrial gas equipment installation and utilization, Z83; Glossary of environmental terms, Z84; Library supplies and equipment, Z85; Temperature measurement thermocouples, C96; Use of decimalized inch, B87. He also reported the addition of two new staff members—Miss Rose White, consumer goods, and L. A. Carvey, safety. More than one-quarter of the staff have been with ASA for more than 15 years, he said, and five have been with ASA for more than 25 years.

An important contract has just been signed with the Bureau of Ships to determine which American Standards and other industrial standards are equivalent to those of the Bureau of Ships.

There has been a great increase in international activity, Admiral Hussey said. In 1957, ASA issued 59 credentials for ISO delegates. In the first 9½ months of 1960, credentials were issued for 139 delegates to ISO meetings, 40 to ISO observers, and 63 to IEC delegates. He called attention to the fact that the Office Equipment Manufacturers Association has set up a special group to handle the national and international projects on data processing equipment. The American Water Works Association has established an international committee to guide its members in the international field and ASME has set up an international committee which will be concerned with policies but not with technical details.

## SESSION 2. POLICY DIRECTION AND PROGRAMMING OF THE DEPARTMENT OF DEFENSE.



THE PANEL—George W. Ritter, speaking; Paul H. Riley; G. J. Marks; E. J. Nucci.

RIGHT—Frank McGinnis, Sperry Gyroscope, with E. J. Nucci at close of Session 2.



**Sponsor: Office of the Secretary of Defense.**

**G**EORGE W. RITTER, staff director, Utilization of Cataloging and Standardization, Office of the Assistant Secretary of Defense (Supply and Logistics), introduced the speakers.

Progress has already been made in coordinating and integrating logistics management for the huge military supply system, declared Paul H. Riley, director for supply management policy, Office of the Assistant Secretary of Defense (Supply and Logistics). Items of supply are now identified and cataloged under a single system, whether used in the Army, Navy, Air Force, or Marine Corps. Under the commodity single manager system, one military department procures, stocks, and distributes common-use materials and supplies for all of the Armed Services. This, Mr Riley estimates, has produced a one-time savings of over \$425 million and is also saving approximately \$20 million each year. He estimates that total inventories were reduced by \$10 billion during the three-year period from 1957-1960.

A series of studies in the entire area of defense standardization is being used to rechart the standardization course for the future, Mr Riley pointed out. These studies have shown that the defense standardization program is too big, he said; it gives equal emphasis to all areas of materiel; the program is directed predominately toward reduction of items in the current inventory; effective discipline in use of standards is lacking; greater use of standardization products and efforts of industry is a necessity; pro-

cedures for reaching agreement upon proposed solutions require overhauling. As a result, steps are being taken to determine where changes should be made, Mr Riley said.

To enable the Department of Defense to adopt them, industry standards must not conflict or duplicate each other and must have a high degree of acceptance by the industry to which they apply, Mr Riley pointed out. He urged that the American Standards Association effectively coordinate all standardization activity to eliminate competition between the standardization efforts within industry and between industry and the Department of Defense.

The scientific and technical revolution in development of military weapons, vehicles, and support equipment calls for a reappraisal of the entire system of military strategy, logistics, and tactics, said G. J. Marks, staff specialist, Office of the Director of Defense (Research and Engineering). Today, he explained, progressively higher levels of performance are called for under progressively more severe environmental operating conditions, with weapons of progressively greater cost per item, far greater complexity, and with a decided decrease in the numbers of weapons of each type in service.

"The engineering standardization concept aims to determine and provide the information needed by the designer of a piece of new equipment to produce a reliable, durable, functional, compatible, producible



DoD literature disappeared fast following the speeches.

### SESSION 3. DEFENSE STANDARDIZATION OPERATIONS.

DoD panel answered questions in Session 3: George W. Ritter, speaking; James Mars, Navy; Chester Nazian, Army; W. S. Hutchinson; Daniel Bennett, Air Force; E. J. Nucci; Colonel E. T. Wiley.



**D**ATA RELIABILITY OR FAILURE is important to this country's welfare, as well as parts' reliability or failure, declared W. S. Hutchinson, Standardization Division, Armed Forces Supply and Support Center. Every military item designed, tested, evaluated, procured, supported, and maintained is backed up by engineering data, he pointed out. Therefore, documentation must make the data available to those who design the weapons and to all who must operate and support those weapons. Communicating large bodies of data, where and when needed, has become a vital logistical function, he said.

Mr Hutchinson showed by means of slides what the problem of the Department of Defense is, how documentation is used, and what the policy is. He also listed the documents being prepared for design guidance and engineering reference, those for procurement of engineering data, and engineering drawings, associated lists, and drafting practices. A project on DoD Engineering Data Systems concerns studies of data requirements for the purpose of establishing recommendations for data systems.

working prototype," Mr Marks declared. However, if engineering standards are not truly dynamic, they are not serving the needs of the design and development people, he pointed out. As a test he suggested a series of questions to determine the part the designer plays in deciding what engineering standards are needed, in checking whether the standards are timely, whether too much time is required to develop the standards, and whether the standard can be readily revised.

A plan for preparing specifications to assure greater reliability of electronic parts has been proposed in a recently issued report entitled "Parts Specifications Management for Reliability," said E. J. Nucci. Mr Nucci is reliability coordinator, Office of Electronics, Office of Deputy Director of Research and Engineering, Department of Defense. The report was prepared by the Ad Hoc Study Committee on Electronic Parts Specifications Management for Reliability, with P.S. Darnell, Bell Telephone Laboratories, as chairman. The report, in two volumes, became available in early July, 1960, Mr Nucci said.

**Sponsor: Office of the Secretary of Defense. Colonel E. T. Wiley, Jr, chief, Standardization Division, Armed Forces Supply and Support Center, Department of Defense, introduced the speakers.**

Implementation of MIL-D-70327 is the first milestone on the path to real unification of Armed Forces requirements for engineering data, Mr Hutchinson declared.

Extensive use of microfilmed data has superseded the former practice of controlling drawings received from contractors of missile and rocket systems in hard copy form, Mr Hutchinson pointed out.

Among important new developments is a new DoD Index to Specifications and Standards, Mr Hutchinson reported. In place of an index published by each department, one consolidated index is now being published, with the complete index data being programmed in IBM computers.

Colonel E. T. Wiley, Jr, chief of the Standardization Division, Armed Forces Supply and Support Center,



Department of Defense, reported on recent developments in standardization. He explained a number of MIL standards that affect standardization and testing of military equipment. These include MIL-STD-143, Order of Precedence for Specification and Standards; MIL-STD-202B, Test Methods for Electronic and Electrical Component Parts; MIL-STD-449, Military Standard on Measurement of Radio Frequency Spectrum Characteristics; MIL-M-9868, Requirements for Microfilming of Engineering Documents, 35mm; MIL-P-9879, Photographing of Construction/Architectural Drawings, Maps, and Related Documents, 105mm; MIL-C-9877, Aperture Cards; MIL-C-9878, Cards, Tabulating and Aperture for Engineering Data Micro-Reproduction System; MIL-STD-804, Formats and Coding of Tabulating and Aperture Cards for Engineering Data Micro-Reproduction System. In addition, Colonel Wiley said, a proposed Military Standard is being prepared for Engineering Data Micro-Reproduction Systems, covering equipments that will

be repetitively procured and not covered by detail specifications. Colonel Wiley also displayed an advance copy of a glossary of photographic terms developed as a Military Standardization Handbook. A glossary of packaging terms is available in FED-STD-75.

Colonel Wiley explained that DoD Instruction 4120.8 on the use of standardization documents issued by industry groups provides for the outright adoption of industry standards where all the requirements of the military services are met. Such industry documents will retain their industry symbol and will be so indexed. The instruction also establishes as a firm policy the referencing of industry standards and specifications in military documents to meet specific requirements.

Following the presentations by Colonel Wiley and Mr Hutchinson, a panel of speakers and other representatives of the military departments answered questions from the floor.

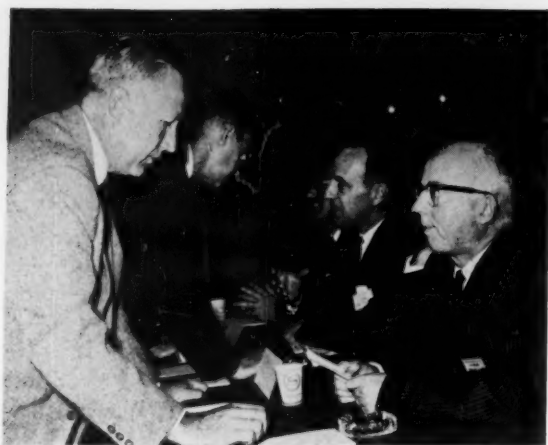
#### SESSION 4. HOW ASA SERVES COMPANY STANDARDS NEEDS.



TOP—Frank J. Heller points to program held by Dwight Hollingsworth, while F. C. Frost and Rutherford H. Fenn look on. BOTTOM—J. E. Wiltrakis, Western Electric Company, asks a question during Session 4.

**Sponsor: ASA Company Member Conference. Dwight F. Hollingsworth, chairman of CMC and principal standards engineer, E.I. du Pont de Nemours & Company, Wilmington, Delaware, chairman.**

**T**HERE IS A TENDENCY to take our national standards for granted," said Frank J. Heller, secretary, Engineering Standards Committee, Phillips Petroleum Company, Bartlesville, Oklahoma. "Can you imagine how the nation's progress and economy would be impeded if each design engineer in designing a plant, piece of equipment, or general project had to redevelop the requirements covered by American Standard piping codes, American Society of Mechanical Engineers standards for pressure vessels, the National Electrical Code, American Society for Testing Materials standards, American Standard screw thread



Frank Heller and F. C. Frost answer questions following Session 4. Asking question in right foreground is J. J. McAleer, Socony Mobil Company.

manuals, and similar national standards? Can you imagine the purchasing agent's dilemma if he had to buy materials to such voluminous individually developed requirements? Can you imagine the development and procurement costs?" "It is evident, therefore, that ASA renders its biggest service to company standardization by providing means whereby national standards can be promulgated and distributed," he said.

Explaining how Phillips Petroleum Company makes use of standards, Mr Heller pointed out that the company, which is centralized and fully integrated, with more than \$1½ billion in assets, is one of the 25 largest corporations in the United States. Phillips has 23 departments in its corporate structure and is highly diversified, he explained. In addition to the usual petroleum company activities, it has a large interest in chemicals, plastics, synthetic rubber, and ammonia manufacture, uranium mining and milling, atomic reactor operation, and many others.

In 1955, the top management of Phillips established a company-wide engineering standards committee, and follows its progress with interest, Mr Heller said. One aim of the program is to control variation without stifling initiative. Another is to use standardization to engineer unnecessary costs out of products and equipment that are purchased. The aim is to develop standards that will be an authoritative source of information to free the company's technical talent from repetitious jobs. Experience has proven that standards in Phillips shorten the interval between executive decision and its application, Mr Heller said. "Studies inherent in the development stage of a company standard often uncover needs for national standardization," Mr Heller pointed out. Often, too, development of new national standards can result in a timely revision of a company standard. Phillips has referenced 136 national standards and codes in its company standards.

Standards and automation being key elements in management control, they are coordinated at Phillips by having the chairman and secretary of the engineering standards committee serve in the same capacities on the automation steering committee. Both committees report to the executive vice-president.

Emphasizing the importance of keeping standards up to date because of the unprecedented rate of change in the space age, Mr Heller pointed out that the company's standards are reviewed at least every two years to determine if they have been brought up to date.

"It is a shared opinion in Phillips that the future holds promise of continued growth and that the continued adoption of standards will have a profound influence on the future of our business," Mr Heller said.

Calling attention to the amount and variety of information on standards that can be obtained from the American Standards Association, F.C. Frost of ASA's administrative staff pointed out that ASA is literally a service organization.

ASA provides two general types of services: (1) functional services provided by the Association itself, and (2) informational services provided by the staff and the facilities at headquarters.

"It is your manpower, time, and expense that are saved through the coordination effected by ASA," Mr Frost said. "It is you who are confronted by the problems which can be solved through standardization and who therefore initiate the action which leads to development of the desired standards through co-operation at the national level."

In addition to coordination of standards nationally, ASA serves industry as the American channel in international cooperation in standardization work, he pointed out.

Mr Frost listed information about American Standards, other standards, and standards from other countries, as well as publication of *THE MAGAZINE OF*



Papers of Session 4 were popular with the audience.

STANDARDS and use of ASA's library as among the informational services provided by ASA.

"Rather than set up a company standard, we make direct use of an American Standard when one is available which completely covers the subject," Rutherford H. Fenn, supervisor, engineering standards, Pitney-Bowes, Inc, told the conference.

Membership in ASA has paid, and continues to pay, high dividends, Mr Fenn said. Draftsmen and designers in all engineering departments of the company use American Standard abbreviations for drawings, the various graphical symbols, and drafting standards. In addition, he said, our engineers now think in terms of an American Standard and rely on

ASA to supply answers to questions involving these standards.

When Pitney-Bowes was setting up an international division, Mr Fenn continued, ASA supplied its engineers with information relating to electrical standards in several countries. In another instance, ASA interpreted engineering drawings of a Netherlands-designed mail sorting machine that the company had contracted to manufacture.

Mr Fenn emphasized that THE MAGAZINE OF STANDARDS had also served his company by keeping it in touch with standardization activities in industry. Some of the articles had provided money-saving ideas in the standards operation of Pitney-Bowes.

#### SESSION 5. CREATING STANDARDS PROGRAMS IN NEW AREAS. PART I.



Session 5 speakers (left to right)—R. W. Green; A. Craig Reynolds; Dwight F. Hollingsworth; Dr Joseph W. Barker; Irving Liggett.

**W**ORK RECENTLY STARTED on standards for data processing equipment was explained by Dr J.W. Barker, acting director of the Data Processing Group, Office Equipment Manufacturers Institute. The Institute is sponsor for the recently organized Project X3, and has assigned responsibility for it to the Data Processing Group.

The scope of the new project emphasizes standardization for the "logic" of data processing systems, deferring the "hardware" phase to secondary place, Dr Barker explained.

The secretariat for the international work on data processing systems, including digital computers, recently initiated by the International Organization for Standardization (ISO), and assigned to the USA, will also be handled by the Data Processing Group.

The Data Processing Group of OEMI consists of 22 companies. It recently established its headquarters at 420 Lexington Avenue, New York. John H. Howard, formerly of the Burroughs Corporation, has been named director, and Herbert S. Bright, formerly of the Westinghouse Electric Corporation, has been named director of engineering activities.

Sectional Committee X3 has been organized with six subcommittees (see page 286, THE MAGAZINE OF STANDARDS, September, 1960).

**Sponsor: ASA Company Member Conference. Dwight F. Hollingsworth, chairman.**

In addition to the Data Processing Group, OEMI has set up an Office Machines Group, which has been assigned to handle the work of Sectional Committee X4, Office Machines. Some of these machines may serve as either input or output media for data processing systems and devices, Dr Barker pointed out.

One of the problems in developing standards for data processing is character recognition. This was the subject discussed in a paper by B.W. Pollard, assistant to the vice-president, Burroughs Corporation, Detroit, and presented for Mr Pollard by Irving Liggett, IBM Corporation, chairman of Subcommittee X3-2. Mr Pollard is chairman of Subcommittee X3-1 which plans to work on standard sets of characters that will be legible to humans and that will make possible interchange of information between data processing systems. Subcommittee X3-2 is concerned with machine-sensible coded character sets.

Two meetings of X3-1 have been held, Mr Pollard reported, in addition to a joint meeting with the National Retail Merchants Association's "manufacturers subcommittee." Three task groups are working on (1) Determination of a suitable font or fonts;

(2) Determination of printing requirements and printer capabilities; and (3) Determination of format and applications.

The objectives of Subcommittee X3-2 have been defined as being to "determine external standards in character sets and data format which will facilitate system communications." "To this end," Mr Liggett, the chairman, is quoted as saying, "the major question seems to be—should we modify an existing concept, or develop a new concept or concepts? Furthermore, if a new concept is found to be the best approach, what suggestions can be made to facilitate conversion?"

"By standardization, the data processing industry will have a base from which to develop the wide range of equipment needed to meet the requirements of the users," Mr Pollard pointed out. "At a time of critical technical manpower shortage, the industry will avoid unnecessary duplication of effort in the determination of basic parameters and concepts. It will be possible for equipments manufactured by the various companies to communicate one with another. Technical progress will be speeded up and there will be less likelihood of equipments being made obsolete by major changes in basic concepts. In other words, by adequate industry-wide planning, resulting in accepted standards, we can look to a steady and economic evolution of the requisite data processing systems."

*Communications and languages* in the data processing field were discussed by A. Craig Reynolds, Jr, Stromberg Division of General Time Corporation, and chairman of Subcommittee X3-3.

Seldom if ever has an art so new required standardization of the most basic sort at such an early point in its existence, Mr Reynolds commented. This is primarily due to user pressure for compatibility of equipments, he explained. However, the problem is to satisfy such requirements without compromising the competitive positions and proprietary interests of the companies involved, either user or manufacturer.

Subcommittees X3-3 and X3-4 are concerned with two basic problem areas: first, communication between machines, and second, communication between humans and machines. Subcommittee X3-3 has the broad responsibility of establishing standards for data transmission, Mr Reynolds explained. The major standardizing activities in the communications industry have involved the establishment of satisfactory levels of performance for the operation of telephone and telegraph systems connected by wire. With the advent of radio and television, the industry faced and mastered a new complex of standards problems. These standards were of only academic interest to other industries, he explained. However, the economic utilization of large-scale computers for business purposes requires that they be employed for a maximum amount of their available time.



Al Gassler, Consolidated Edison, New York, former member of the CMC Administrative Committee (left), talks with two former CMC chairmen—S. H. Watson, RCA, chairman of the Conference program committee, and J. M. Goldsmith, Armco Steel, Kansas City.

Dollars are involved in this problem in several ways, Mr Reynolds said. First and foremost, the computer-communications ensemble is dealing with accurate allocation and payment of costs for the procurement and use of men, material, and time. The high order of reliability called for can only be obtained by establishment of standards that are equally acceptable and usable by the manufacturers of data processing equipment, the manufacturers and operators of the equipment comprising the communication network, and the user who pays for the equipments.

Second, the terminal equipments provided by the data processing industry must be economic for the user. Again, the establishment of appropriate standards is a basic requirement.

Third, economic utilization of the communications systems dictates a rapid rate of reliable data transmission. Here, also, a common set of standards is required.

Subcommittee X3-4, with Dr J.C. Chu as chairman, is concerned with the problem of human beings communicating with machines, Mr Reynolds pointed out.

This problem is so new that its very existence is virtually unknown to any except the manufacturers and users of computer equipment, he said. The initial step for solution is to formulate standards regarding the language, or methodology, of preparing instructions for the computer to use in solving problems presented to it. The language used in programming a computer must be so constructed and organized that a human operator can be employed without the necessity of a major new education in specific computer technology, Mr Reynolds declared. Also, the computer must be able to arrive at accurate answers from data so presented.

Computers as presently designed are idiot geniuses, he said. They will follow instructions completely and literally at fantastic speeds, but their ability to determine logical inconsistency in the instructions and to communicate backwards, requesting clarification and communication of corrections, is present in varying degrees. Because of the diversity of the tasks pre-



sented to computers, ranging from the solution of complex aggregates of partial differential equations to payroll preparation, it is impractical to present the computer with detailed step-by-step instructions without omission and with complete logical consistency, Mr Reynolds pointed out. Each class of problem has its own language and formal logical structure that must be followed in order to arrive at an accurate answer. A better approach, Mr Reynolds believes, is to construct languages that are easily interpreted by both human and computer alike and that conform to the general logical capabilities of all computers rather than to one specific type.

Since the language of the businessman and that of the scientist are vastly different and the machines must be used by both groups, Mr Reynolds also believes that a practical solution is to provide the computers with two languages, one oriented towards interpretation of instructions for solution of scientific problems, and the second similarly oriented for solution of business problems.

To construct such languages, a common denominator in defining the logical structure of computers must be found, and terms and operations must be defined, Mr Reynolds suggested. This should be done, he said, not only to make possible intelligible communications about the problem, but also to preserve the creativity of the designers for developing and producing new classes of computers. A major effort has been made, and is continuing, by users and manufacturers of computers to arrive at compatible common language structures. "Standardization of the most fundamental sort is mandatory if further progress is to be efficiently achieved. It is in this area that Subcommittee X3-4 finds its reason for being and its tasks for the future," Mr Reynolds declared.

*Terminology, editing, and applications* problems in data processing, as handled by Subcommittees X3-5 and X3-6, were described by John T. Davidson,

chairman of Subcommittee X3-6. Mr Davidson is vice-president, engineering and research, The Standards Register Company. Mr Davidson's paper was presented by Robert W. Green.

The kinds of information needed to communicate effectively in the data processing and computing field must be determined, Mr Davidson explained, and consistent definitions must be established for those basic terms and symbols which are needed for a mutual understanding.

After existing up-to-date glossaries and standards are examined and existing experience and available information studied, a working glossary must be prepared, Mr Davidson said. This should include terms applicable to the scientific, mathematic, industrial, and commercial fields. This is one of the functions of Subcommittee X3-5. E.A. Emerson, National Cash Register, Hawthorne, California, is chairman.

The principal remaining function is to edit the final reports from the other subcommittees, Mr Davidson explained.

Task Group 1 will be responsible for preparing the glossary of data processing terms. Task Group 2 will establish a standard set of terms and definitions to describe internal machine operations. Task Group 3 will edit subcommittee reports.

Subcommittee X3-6 has the responsibility for determining what difficulties may be encountered in obtaining information needed to program the data processing system in order to solve a problem, Mr Davidson said. It will also determine what needs to be standardized, what can be standardized, and what benefits may result from this standardization.

Standardization of flow chart symbols and procedures is also included in the project.

The members of these subcommittees are experienced, interested, and dedicated people who are on the subcommittees for only one purpose—the accomplishment of the stated tasks, Mr Davidson declared.

## SESSION 6. CREATING STANDARDS PROGRAMS IN NEW AREAS, PART II.

*Sponsor: ASA Company Member Conference. William H. Old, director of purchasing, The Babcock and Wilcox Company, chairman.*

CARL E. NELSON, technical staff, Bell Telephone Laboratories, with the assistance of W. J. Locke, presented a film showing how the Laboratories handles its microfilmed drawings and makes them available quickly and easily to the engineers who use them. Mr Nelson introduced the film by describing the development of microfilm and both American Standards and Military Standards covering its production, processing, storage, and use.

*Carl E. Nelson displays Bell Laboratories' punched card for microfilm to W. J. Locke and William H. Old at Session 6.*

December 1960





RIGHT—New officers of the Company Member Conference meet with two new members of the Administrative Committee (left to right) C. W. Stockwell, International Harvester; Scott Liston, chairman; Philip Callan, Eastman Kodak, vice-chairman; E. Woerter, American Machine & Foundry Company. Bernard W. Base, Standard Oil of Indiana, and Robert F. Franciose, General Electric, were also elected members of the Administrative Committee.

In view of the advance toward a basis for industry-wide standards in the past two or three years and the desire for a common ground, ASA Sectional Committee PH5 should find its activities accelerated.

The Department of Defense deserves credit for its work on microfilm standards, Mr Nelson pointed out. A year ago each department and service had its own microfilm specifications, while today there is a set of standard specifications for the whole Department.

In the process of formulating the DoD specifications, representatives of industry were invited to participate, making industry, which will be supplying DoD with microfilm, a party to the established rules, Mr Nelson declared. The result has been a general climate for seeking agreement on standards which can guide the whole industry.

Industry use of microfilm appears to be just beginning, Mr Nelson commented. "This places great emphasis on getting approved American Standards as rapidly as possible so manufacturers can proceed with confidence to provide better tools, and users can plan microfilm systems with assurance," he said. He listed ten American Standards that now affect microfilm.

Standards are urgently needed to cover a number of other areas, being most pressing in the application of microfilm to engineering drawings, Mr Nelson said. Other areas he listed include quality of microfilm, materials, hardware, drafting, and methods of practice.

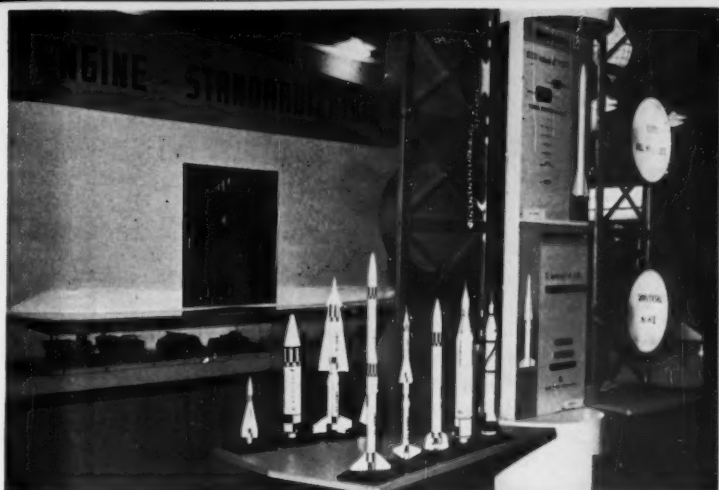
Wherever American Standards have been available, the Bell System has used them. However, where no American Standards are yet available, new standards have been developed for Bell System use, Mr Nelson explained. Quality and materials standards very closely parallel the new Department of Defense specifications, he said.

TOP—Scott Liston, Diamond Alkali Company, chairman-elect of the Company Member Conference, and H. C. Ball, Humble Oil & Refining Company, Baytown, Texas, chairman of next year's National Conference program committee. CENTER—Dwight Hollingsworth (right) congratulates Mr Liston on his election. BOTTOM—Mr Hollingsworth accepts scroll of appreciation for his work as CMC chairman from Vice Admiral G. F. Hussey, Jr, USN (Ret), ASA's managing director.



# Standardization EXHIBITS

Engine standardization is a program to which DoD points with pride. The exhibit on missiles shows reduction from 1,150 to 520 types of resistors used in all missiles.



The impressive standardization exhibit of the Department of Defense offered one of the centers of interest at the Eleventh National Conference on Standards. In an introduction to the exhibit, Lieutenant General J. H. Hinrichs, chief of Ordnance, said, "We in the Army Ordnance have the oldest and, we think, one of the best standardization programs in the country.

"I think it is significant that the standardization action which started mass production had to do with Army Ordnance equipment. This was, of course, Eli Whitney's interchangeable 'standards of arms.' I like to think that Army Ordnance is still leading the country in standardization. Of course, our equipment is now much more complex than it was in Whitney's time and becomes more so every day. This makes standardization all the more essential and helps to explain our emphasis on it."

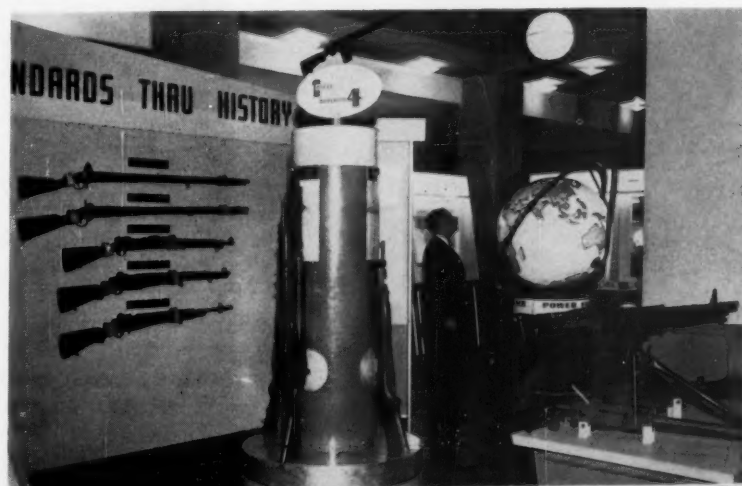
"Standards Thru History," the rifle exhibit, showed the development from Eli Whitney's first "interchangeable parts" musket to today's single type which now replaces 4 formerly used.

The Office of Naval Material showed slides illustrating the new document control system and work leading to a single standards index for Army, Navy, and Air Force. Using MIL-STD-701A as an example, the exhibit showed how 4,000 types of transistors had been cut to 50, while raising reliability and cutting costs.

(See page 370 for more exhibits.)



In the case of binoculars, 5 parts replaced 97. The new binoculars provide only 1 item which is nonmaintained, as against 119, for which repair parts had to be maintained.



## The Awards Luncheon

Standards Medalists Perry Houser, William P. Kliment, Frank O. Hoagland, and Dr John Gaillard were luncheon guests. Around table, left to right—Mr Houser, Mrs J. W. McNair, Mr Kliment, Miss Minnie Smith, Dr Gaillard, Mrs Perry Houser. Mr Hoagland and Mrs Gaillard are sitting with backs to the camera.



ABOVE, TOP—Robert F. Orth, Awards Luncheon speaker, at the podium after introduction by ASA President John R. Townsend (left).

Dr John Gaillard with W. B. Fleming, Jeffrey Manufacturing Company, Columbus, Ohio, and Ralph McKay, Shell Chemical Company, New York.

RIGHT—Frederick S. Blackall, Jr (Howard Coonley Medal, 1956) receives applause. At the table are Mrs Blackall (left), Mrs Cyril Ainsworth, and William L. Batt (Howard Coonley Medal, 1952).



AMERICANS IN INDUSTRY who can influence policy must show free-enterprise initiative in international trade circles by promoting our high quality standards, said Robert F. Orth at the annual awards luncheon. Mr Orth, vice-president, Johns-Manville Corporation, spoke on "Industrial Statesmanship at the International Level."

"Many foreign products enter this country at a competitive advantage over our products because we of American industry have not insisted that they be brought up to our American standards," Mr Orth said. "Many American products are also barred entry into foreign countries because our standards and specifications differ from those abroad. More than 1900 of our standards, approved as American Standards by the ASA, have yet to be translated for use in foreign countries."

Urging that U.S. industry support the standards work to the end that the U.S. be represented on every international committee on standards, Mr Orth said: "If we are not to get the short end of the stick in this mad scramble for trade, it behooves us to bestir ourselves. Let's make a determined effort to send American industrialists to many more meetings where ISO and IEC representatives thrash out the problems of international standards."

Nine recipients of the Howard Coonley Medal and The Standards Medal were guests of ASA at the awards luncheon: The special guests were Mr and Mrs William L. Batt, Mr and Mrs Frederick S. Blackall, Jr, Mr Howard Coonley, Dr and Mrs John Gaillard, Mr Roger E. Gay, Mr Vincent de P. Goubeau, Mr Frank O. Hoagland and his secretary, Mrs Minnie G. Smith, Mr and Mrs Perry L. Houser, Mr William P. Kliment, and Mrs Paul G. Agnew.



**THE  
HOWARD  
COONLEY  
MEDAL**

**T**HE HOWARD COONLEY MEDAL, a gold medal awarded each year to an executive who has rendered great service in advancing the national economy through voluntary standards, was awarded this year to J. H. Foote. Mr Foote is vice-president of Commonwealth Services, Inc. and is a member of ASA's Board of Directors.

The Howard Coonley Medal has been awarded to The Honorable Herbert Hoover, William L. Batt, Ralph E. Flanders, Thomas D. Jolly, Harold S. Osborne, Frederick S. Blackall, Jr, Roger E. Gay, John R. Suman, and Vincent de P. Goubeau. Howard Coonley, first recipient of the Medal, for whom it was named, was president and chairman of the board of the Walworth Company, and was the first president of the International Organization for Standardization. He served for 22 years on the board of directors of the American Standards Association.

*James Harold Foote*

**CITATION:** As an executive and director of Commonwealth Associates, Inc, and as a leading authority in the field of electrical engineering and as a former president of the American Institute of Electrical Engineers, he has been one of the foremost advocates in the promotion and advancement of standardization. For over forty years, he has been dedicated to the support of the standards movement. Much of his engineering work formed the basis for improvements in electrical industry standards of the American Society for Testing Materials and in American Standards approved by the American Standards Association. As a member of the policy boards and committees of those organizations, as well as of the American Institute of Electrical Engineers, he has been instrumental in encouraging other industry representatives to recognize the importance of standardization. He has been similarly active in the standards work of his own company, in the Edison Electric Institute, and in the Association of Edison Illuminating Companies. He has served as a delegate to annual meetings of the International Electrotechnical Commission and the International Conference on Large Electric High-Tension Systems. Through his activities, both here and abroad, he has served the voluntary standards movement with remarkable foresight, ingenuity, leadership, and accomplishment.



**CITATION:** His broad technical knowledge, his organizational skills, and his untiring efforts in standardization have been a source of inspiration to industry and standardizing bodies throughout the world. Until his recent retirement, he was manager of the standards division of General Electric Company where he set an exemplary pattern for company standardization. He served on many industry and professional committees including those of the National Electrical Manufacturers Association, the National Fire Protection Association, and the American Institute of Electrical Engineers. He has also been actively engaged in solving problems in the field of safety. He has promoted the voluntary application of safety standards in industry and has furthered their adoption as the technical basis for regulatory legislation. He served on many boards and committees of the American Standards Association dealing with nuclear energy, electrical standardization, consumer goods, legal procedures, and others. On an international level, he has made lasting contributions through his work as vice-president of the International Electrotechnical Commission and as president of the U.S. National Committee of the same organization. His leadership in the international field has led to outstanding participation of the electrical and electronic industries of his own and other countries.



*Richard Charles Sogge*

**THE  
STANDARDS  
MEDAL**

**T**HE STANDARDS MEDAL, also a gold medal, is awarded annually to an individual who has served the voluntary standards movement through leadership in the actual development of standards. Richard C. Sogge was honored this year. Mr Sogge, recently retired from the General Electric Company, was vice-president of IEC and president of the U.S. National Committee of IEC from 1953 through 1959. He has worked on 15 boards and committees of ASA and for 12 years was a member of ASA's Standards Council.

Others who have received the Standards Medal are: Paul G. Agnew, Frank O. Hoagland, Perry L. Houser, John Gaillard, James G. Morrow, M.B.E., Charles Rufus Harte, John R. Townsend, William P. Kliment, and William L. Barth.



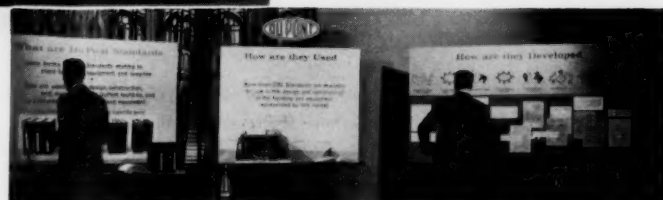
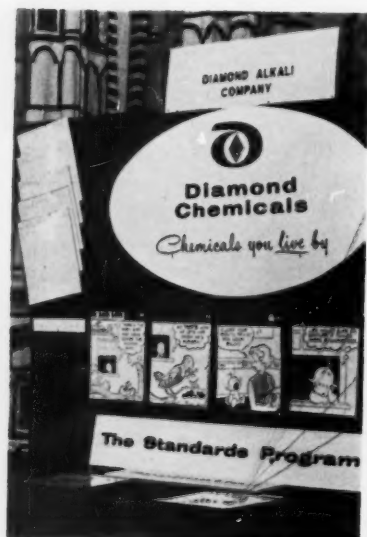
## EXHIBITS

**LEFT**—Part of exhibit area shows booths of Bausch & Lomb, Eastman Kodak, International Harvester, General Motors, and the National Electrical Manufacturers Association.

**RIGHT**—Du Pont's books of standards, a diagram of standards procedures, and a building model noting the standards used answered questions on Du Pont's standards program.

Eastman Kodak votes "YES for ASA standards" was Eastman's exhibit theme. Examples of photographic standards were shown with the products to which they apply.

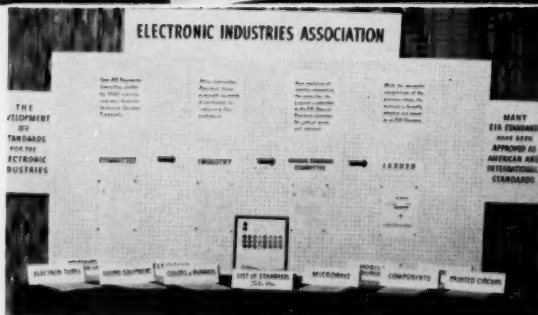
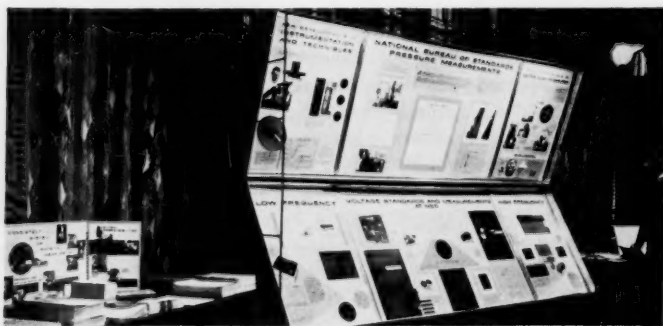
Cartoons enlivened Diamond Chemicals' exhibit.



**BELOW**—The National Bureau of Standards called attention to new developments in instrumentation, ultra-high pressures and pressure measurements, and low and high frequency measurements.

EIA showed how standards are developed for the electronic industries. The American Society for Testing Materials and the American Society for Quality Control (exhibits not shown here) gave information on what standardization means in materials, and on how to use the standard methods of statistical quality control.

ASA's "Standards for a Dynamic Decade" listed projects expected to help in developing the new technologies of the coming decade.





Session 7—(left to right) F. S. Sherwin, E. C. Drew, T. D. Power, H. McDonald, P. P. Heaney, W. H. Old, F. C. Tighe, speaking.

## SESSION 7. VALUE ANALYSIS AS A BASIS OF STANDARDIZATION.

**S**PEAKING ON VALUE ANALYSIS in buying forms and printing, Harold McDonald, Detroit Edison Company, referred to an eight-page quarterly report mailed to Detroit Edison stockholders. By changing from an eight-page booklet to an eight-page folder, the cost of the publication was reduced 24 percent, or \$312.00.

It is almost impossible to buy printing without applying value analysis, Mr McDonald pointed out. The first question to be considered is what kind of printing—a printed form, a magazine, a brochure, or a mailing piece. The answer is determined by its function—operational, informational, or promotional. The extent and importance of the function then determines how it should be prepared, its worth or value, and, consequently, how much it should cost.

Standardization and value analysis really pay off in the publication and use of forms where the selection of the appropriate grade, kind, and weight of paper can result in considerable savings, Mr McDonald declared. The use of standard sizes permits combination printing runs. In many cases, it is possible to reduce or eliminate duplicate forms and operations by active coordination and control, he said.

The best part of value analysis is that the savings usually are recurrent or continual, Mr McDonald pointed out. All we have to do, he said, is put it to work to make the materials or services we use cost no more than they are worth.

Noting several major, interrelated trends within the company in the past several years, Thomas D. Power, manufacturing engineering services, General Electric Company, called attention to decreasing direct labor with corresponding increase in indirect labor, and greater emphasis on intangible savings than on direct savings. This, in turn, presents a need for greater system and control requirements for materials handling applications, he said.

"These trends have forced materials handling problem analysis to use the more sophisticated techniques of work sampling, linear programming, waiting-line analysis, and manufacturing systems simulation in order to measure more accurately indirect labor and intangible savings," Mr Power declared. It is becoming more complex to directly measure and improve materials handling, he said. "Potential savings are becoming more related to indirect and intangible

**Sponsor: National Association of Purchasing Agents. William H. Old, director of purchasing, The Babcock and Wilcox Company, chairman. Peter P. Heaney, director of purchasing, De Jur Amsco Corporation, vice-chairman.**

savings and therefore require a more encompassing system and control approach in order to arrive at an ultimate, justifiable solution."

"Value analysis and standardization is one of the surest ways of meeting domestic and increasing foreign competition," said Edwin C. Drew, Purchasing Department, Solvay Process Division, Allied Chemical Corporation. Mr Drew was speaking on the subject of value analysis as a basis of standardization in packaging. He pointed out that standardization, through value analysis, plays a part in the many hundreds of different types, sizes, and shapes of packages.

"The packaging of goods will play an important part in over-all cost savings and we should set a program to be followed toward this goal," Mr Drew said, and then gave some suggestions for applying value analysis to present and future packaging:

- (1) Consider whether the package is needed. Possibly a simple pallet will be sufficient because of modern shipping methods.
- (2) Study the function of the product to be packed.
- (3) Study customer requirements.
- (4) Study labeling and decorating requirements.
- (5) Analyze transportation problems in your own plant, by public carrier and in the plant of your customer.
- (6) Establish how many units of product a package should contain.

Once such a pattern has been established, Mr Drew continued, it will provide a firm basis on which to institute a new package or change an existing one. In addition, ten tests suggested by General Electric Company can be applied to arrive at the lowest cost of a package in keeping with its intended use:

- (a) Does it contribute value? Is it worth anything? Can the product be handled without this packing?
- (b) Is its cost proportionate with its usefulness? (c) Does it need all its features? (d) Is there anything better for the intended use? (e) Can a satisfactory package be made at lower cost? (f) Can a standard package be found which will be usable? (g) Is it made by the lowest cost method, considering the

quantity involved? (h) Do material, labor, overhead and profit total its cost? (i) Will another dependable supplier provide it for less? (j) Is anyone buying it for less?

*What can value analysis offer to the teamwork effort of business, purchasing, engineering, and manufacturing?* This question was asked by Frederick S. Sherwin, Raytheon Company.

As a package of techniques, he said, value analysis can offer a professional, organized, systematic approach to help determine whether the product is being produced at the lowest possible cost. It can also provide the basic tools with which to develop the lowest cost solution. It can assist in making better decisions in terms of value in the design, procurement, or manufacturing stage of the product cycle.

Noting that large cost reductions can be accomplished through teamwork action, he called attention to an \$11,000 product cost reduction on a particular magnetron tube. Of this, more than \$8,000, or more than 70 percent, was the result of combined action

by two or more of the three functional areas of business, he said. These results were accomplished when representatives of these three functions got together and worked as a team, using value analysis techniques.

When engineering, manufacturing, or purchasing decisions that bring about better value have been made, the resultant components can be used as a basis of standardization, he explained. Many times standard components are already available; at other times, new standards are created. Mr Sherwin used slides to illustrate this point.

*Much can be done to bring order into the chaos that now confronts the shipper or receiver of goods shipped*, said Frank Tighe, assistant general traffic manager, Union Carbide Corporation. He foresees the use of electronic machines to compute the carriers' prices and rate changes. Standardization in transportation forms such as bills of lading, freight bills, and waybills has been partly accomplished but additional work is needed, he said.

## SESSION 8. QUALITY STANDARDS IN MANUFACTURING.

**W**ITH STANDARDIZATION AS THE FORMULA, industries and government agencies could reasonably expect returns as high as \$100 million for every \$1 million invested, Mr McGinnis said.

Reliability is an extra dividend realized from standardization, he pointed out. However, although standardization is unique in that it simultaneously increases reliability and decreases cost and schedule time, it is seldom among the topics presented at reliability seminars.

The absolute necessity for standardization is becoming more and more apparent, Mr McGinnis said, particularly in calibration, component selection and testing, assembly and sub-assembly design, data collection and analysis, and manufacturing processes and controls.

Mr McGinnis pointed to trouble areas of calibration in the "vital ten" categories of measurement:

*Sponsor: American Society for Quality Control and the American Statistical Association. Harold Dodge, chairman of the Society's Standards Committee, and professor of Mathematics and Applied Statistics, Rutgers University, chairman. Frank McGinnis, director, Reliability and Quality Control, Sperry Gyroscope Company, Great Neck, New York, vice-chairman.*

dimensional; optical; temperature and humidity; shock, vibration, and force; microwave; radio frequency; electrical; pressure, vacuum, and flow; infrared; and radiological. Without these standards, he said, we have expensive duplication of effort, vast expenditures on the establishment of make-do company standards that are worthless on a national basis where interchangeability and compatibility are the essentials of economic and reliable production. Pointing to the urgency of the problem, he asked: "From the reliability standpoint, how can we trust the valid-



*The quality control panel—Harold Dodge, Frank McGinnis, Dr R. B. Murphy (standing), Charles A. Bicking.*



ity of such vital information as environmental conditions which are relayed to us by sensors of questionable accuracies? How reliable can a moon shot be when an error of one millionth of an inch in the bore-hole of a gyro can cause an error of 0.03 degree per hour drift?" Mr McGinnis urged standards people to take every opportunity to present this message to Congress.

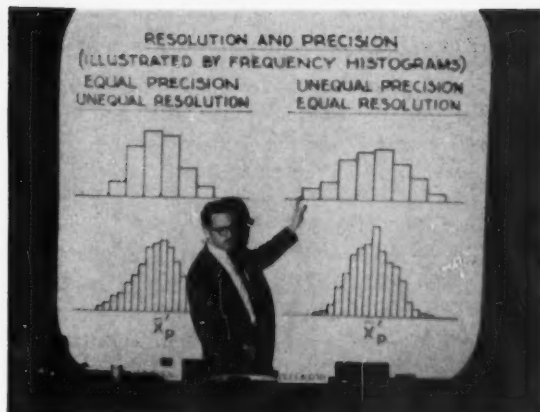
Standardization of measurement procedures should be undertaken by the American Standards Association, Mr McGinnis said, adding: "In fact, we have, in conjunction with the National Bureau of Standards, already formally made this proposal to ASA. This gesture was an outgrowth of the Measurement Research Conference on Internal Diameter Measurement and Calibration."

Mr McGinnis gave examples of the problems involved in calibrating components and part testing to meet the demands of defense and space systems which are increasing at a fantastic rate from day to day. Present specifications often require a 99 percent probability of successful system operation for a minimum of 100 hours, he pointed out. Development of parts and components with capabilities equal to the requirements, and the evaluation and testing programs to insure they meet these demands, result in astronomical costs, he said. Standardization can bring these impossible costs down to the realm of feasibility. Mr McGinnis suggested also that standardization be applied to sub-assemblies and even assemblies, as well as to parts. Why not categorize existing designs according to some cross-coding such as frequency or sensitivity or gain? he asked. "The time wasted in duplication of effort and the money wasted in duplication of evaluation tests would be eliminated," he explained.

Mr McGinnis called attention to standardization programs of the Sperry company which have resulted in important reduction in cost. He also explained the standardized systems set up by Sperry for data processing, which have eliminated duplicate testing, prevented misunderstanding and error, and prevented wasted time.

"There is a dangerous tendency to establish tight controls up to the time the product qualifies in the reliability tests; afterwards, these controls are relaxed," Mr McGinnis warned. "How often, after testing under all types of severe environmental conditions, and after it has been agreed that the design is good, a failure is experienced. If emphasis has been given to standardization of every manufacturing process, specification, and control, we can trace back and find the cause of unreliability."

The quality of manufactured products depends on the application of adequate standards, declared Charles A. Bicking, speaking on quality standards in a manufacturing plant. Mr Bicking is manager of the Quality Control Branch, Research and Development Division, The Carborundum Company.



Pointing to one of his charts, Dr Murphy explains that one process with higher statistical resolution than another may be less precise.

The statistical basis of standards has been recognized since the introduction of modern concepts of quality control by Shewhart, he pointed out.

A complete specification system of quality specifications consists of four basic types of documents: product specifications, process specifications, drawings, and inspection specifications, Mr Bicking said. The specifications should clearly and completely describe the physical requirements and should contain, or reference, the procedure for verifying that the requirements have been met, he said. When standardized, the specification should be approved and accepted by a consensus of its users.

In preparing specifications, sharp attention needs to be given to statistical detail, in Mr Bicking's opinion. Each document should be clearly identified and should be uniform as to format and content.

The preparation and review of the application of specifications is a staff quality control function, he declared. The achievement of quality in production is a manufacturing line responsibility, with the detailed control procedures carried out by a line quality control group and the results depending upon the skill and conscientiousness with which standards are prepared and applied, Mr Bicking said.

In discussing standards for precision and accuracy of measurement and their relation to standards of quality, R. B. Murphy asked the question "What measurements and standards shall be used to gage the exactness and consistency of a method of measurement?" Dr Murphy is quality products engineer, Bell Telephone Laboratories. He described a measurement as the product of several things. First, he said, there must be some specification that tells on paper how the measurement is to be made. Second, a real measurement process must be checked against the specification to catch any differences that might be the result of the environment.

He explained some of the terms and methods used in statistical quality control. The "reference level"

might be compared to the "target value" although it should not include something we want to find rather than something we ought to find because it is there, he explained. With respect to precision and accuracy of measurement, he explained that the first is a long-run average for a fixed reference level, and the difference between them is almost universally referred to as "bias." The "standard deviation" of the measurements is a measure of "scatter" and indicates precision or consistency. Bias and standard deviation together indicate accuracy, Dr Murphy explained. To find them, however, is no mean job, he said. Standard methods are needed to apply to the problem of assessing these quantities. "Sensitivity" is measured by the minimum difference between the measurements of two different units of product which we can possibly

distinguish by the measurement specification under consideration—the smaller the difference, the higher the sensitivity. If our sensitivity is not very good, our precision is not very good, he explained. "Statistical resolution" is the ratio of sensitivity to standard deviation. It is possible that one process has higher statistical resolution than another and yet is less precise, he explained.

Summarizing, Dr Murphy pointed out that standard deviation (or multiples of it) is an indicator of precision and, together with bias, forms an indicator of accuracy. These, with sensitivity and resolution, are the properties that are fundamental to an appreciation of measurement and the problem of its standardization for purposes of assessing product quality against a standard, he declared.

Session 9 panel—Vincent de P. Goubeau and A. P. Frame, standing; (left to right, seated) John W. Young; J. G. Henderson, Union Carbide Chemicals Company (who presented Mr Kettle's paper); W. G. Wright; Milton I. Ross.



## SESSION 9. THE EXECUTIVE VIEWPOINT ON STANDARDS.

**L**IKE VIRTUE, everyone is in favor of standards because, like wholesome food, they're good for us," said Mr Goubeau, in opening the session. "Our costs have increased tremendously in the past dozen years and the increases are continuing. We're finding greater difficulty each day to compete with foreign producers, and more and more we're pricing ourselves out of the market. We must look for all available tools to help us overcome our present handicaps. Profits are hard to come by; and so we'll be amply repaid for the furtherance of standardization work which will make for greater efficiency in carrying on the great American industrial machine." However, Mr Goubeau declared, "Our standards engineers need the support of their managements if we are to make the kind of progress necessary."

Company standardization is more effective if formulated at divisional level than by corporate directives, was the opinion of John W. Young, vice-president, quality and logistics, North American Aviation, Inc.

Mr Young went on to describe the problems caused by lack of central direction for standardization when his company divisionalized in 1956. The areas affected were drafting practice, material and process specifica-

**Vincent de P. Goubeau, vice-president, Radio Corporation of America, chairman.**

tions, and similar engineering documentation. An ad hoc committee was then formed, said Mr Young, and after meetings with division representatives, recommendations were sent to the president. As a result, an engineering standards function was set up in the General Offices.

"In addition, the committee suggested that corporate standards should only be established in areas where they are believed to be beneficial and practical, being careful not to handicap the operations of a division," he explained.

Mr Young pointed out that the success of the corporate standards program in engineering has since influenced other functional sections in the company. Future plans for investigation include the forming of a technical information center, plus standardization efforts in tool engineering, maintenance methods, shipping, packaging, and material handling.

"Management at North American feels that standardization should be more than documentation in terms of specifications, standards, and manuals," Mr Young said. "It must be a philosophy or frame of mind prevailing throughout the company in all man-

agement and working levels. A standard so developed truly represents a more realistic corporate standard."

*Investment in sound standardization* practices by a company can result in a return of \$4.00 for every dollar expended on them, while intangible dividends may far exceed this figure, declared K. A. Kettle. Mr Kettle is associate director, design and construction, Union Carbide Chemicals Company.

Mr Kettle used the standards department function of his own company as a basis for evaluation and explained how projects are initiated largely by application groups. Information on needs, feasibility, anticipated value and usefulness, and technical content are obtained from sources throughout the company.

Costs have been estimated, he said, both before and after standardization in a number of areas. This has proved sufficiently that standards are of economic benefit in producing designs, procuring materials, and effecting installation of production facilities.

Mr Kettle also summed up the basic reasons for the limited approach to standardization by the chemical industry at this time. It is due, he said, to the introduction of new raw materials, new processes, and new products which prevent the adoption of many standards that would seriously restrict this developing industry.

On the other hand, some of the companies in the industry are developing similar standards but working independently of each other. A pooling of these resources would probably lead not only to substantial economies but to accelerated improvement in the standards themselves, in Mr Kettle's opinion.

Mr Kettle emphasized his belief that many millions of dollars could be saved by the industry through standardization projects recommended by the ASA Chemical Industry Advisory Board.

"It would seem highly desirable, therefore, that the chemical industry take even fuller advantage of the excellent standardization facilities now available," Mr Kettle concluded.

*The western world* must increase its efforts to promote standardization if it is to meet successfully the economic competition from totalitarian countries, Walter G. Wright, vice-president of operations, General Telephone and Electronics Corporation, declared.

"In a totalitarian regime," he said, "standardization is imposed 'by authority' in direct contrast to the 'by general consent' approach typical of the free world."

"To effect the necessary cooperation for promoting standardization calls for industrial diplomacy of high order and the willingness of companies and industries alike to accept certain recommended standards and standardization for the ultimate good of the national economies," Mr Wright pointed out.

"Standardization by itself cannot improve the economic status of anyone," he said, "but it is an acknowledged and significant factor in improving industrial

productivity. This in turn enhances the purchasing power of an hour of labor which is the essence of improved living standards."

"It follows logically, therefore, that by this process further standardization offers a significant offset to the pressures of inflation being placed upon our economy from all sides," Mr Wright emphasized.

He concluded by saying that "the general consent approach"—or what he preferred to call "friendly persuasion"—"remains the best hope of accomplishing the objective of promoting standardization through industry."

*Each year the petroleum industry* is spending something like \$9,400,000 on all phases of standardization, but the benefits have made this investment worthwhile, said Alfred P. Frame, senior vice-president and director, Cities Service Company.

"In production, manufacturing, transportation, and marketing, standardization has resulted in new efficiencies, reductions in operating costs, and the opening up of new markets for products," Mr Frame pointed out.

Standardization in petroleum is concerned with the products made and with the materials purchased. The bulk of these standardization activities is conducted under the American Petroleum Institute and the American Society for Testing Materials, and many of the standards are approved by the American Standards Association, according to Mr Frame.

The industry is deeply concerned with standards for materials which it utilizes or consumes, he said, and cited as an example the area of oil-field equipment and materials. Committees are at work on specifications for high-strength casing and tubing, standards for thread casing joints, and the development of new requirements for valve sizes and pressures, to name a few.

Mr Frame explained that achievement in this area will lead to important new efficiencies and economies in drilling operations. A committee has been appointed to formulate standards for drilling fluid materials. This is a major undertaking inasmuch as the



Milton I. Ross (right) explains to Alfred P. Frame how standard mold bases and cavities make it possible to change quickly from one job to another.



industry spends over \$100 million a year for drilling-mud materials.

He said that the industry recognizes the necessity for a free exchange of views, particularly in the areas of producer-consumer relationship. The advice, consent, and cooperation of the people most directly concerned in the development and promulgation of standards specifications is constantly sought.

"The positive results of this policy are evident," Mr Frame noted, "as we make fewer mistakes from the guidance received and we are assured in advance of the acceptance of any changes we make in existing standards, or any new standards established."

Mr Frame concluded by saying that American industry is now entering a critical stage of development and, by promoting a program of voluntary standardization to increase efficiencies and capacities, it will serve to outpace the maximum performances of the regimented economy of communism.

Applying standardization to product design, tooling, and equipment was the subject discussed by Milton I. Ross, who described how his own company has put standards to work. Mr Ross is president of the Milton Ross Metals Company, Hatboro, Pennsylvania. Four concepts are part of his company's over-all policy, he said. These are standard product design; standardization of tooling; standardization of equipment; and education of industry. In order

to carry through a national business, a small company must be very dynamic, inventive, and aggressive to establish its reputation and sales, Mr Ross pointed out. Starting as precision custom molders, the company now manufactures electronic components. One of the new lines will be precision plastic gears that will be available off the counter on a national basis. Standardization helps this small company to equalize its year-round production, Mr Ross explained. This allows time to devote to specialized custom molding. Mr Ross described many of the standard product designs which make it possible for the company to purchase materials in large quantities and sell the product at a low price.

Standardization of mold bases and cavities makes it possible to change molds quickly and reduce lost production time to minutes rather than hours, Mr Ross pointed out.

On the need for educating prospective customers to know his company and its products, Mr Ross commented: "The better mousetrap is of value only if they have been made aware that their house has been infested with mice."

"It is our hope that the American Standards Association will continue to stimulate engineering and purchasing into looking for standard products and encourage manufacturers to develop their special products into standard products," he said.



At Session 10—E. A. Lundberg, speaking, Byron Bloomfield, Herman York, Theodore W. Dominick, John K. Bowersox.

#### SESSION 10. ACCOMPLISHMENTS, DEVELOPMENTS, AND NEED FOR STANDARDS ACTIVITIES IN THE BUILDING INDUSTRY.

"MODULAR MEASURE has been the aspiration of leading architects, homebuilders, and contractors since the early 30's," Mr Bloomfield explained. "Discussion in this session," he said, "is related to the changes in planning, production, and marketing, and construction techniques that have taken place in the last 15 years." The specific year of reference is 1945 when ASA approved American Standard A62.1-1945, Basis for the Coordination of Dimensions of Building Materials and Equipment. "Because of the widespread effect this standard has had on the building industry, I believe it will ultimately be recognized as the greatest single achievement ever to be realized through ASA procedures," Mr Bloomfield declared.

**Sponsor:** Modular Building Standards Association. Byron Bloomfield, executive director of the Association, and secretary of ASA Sectional Committee on Modular Coordination, chairman.

Mr Bloomfield announced that a foundation grant has made it possible to employ two professors of architecture and one architectural consultant to prepare a textbook and architectural reference manual on modular principles and practices. John Wiley and Sons is scheduled to release the book this Fall.

As secretariat to ASA Sectional Committee A62, MBSA is now considering the possibility of reorganizing the methods heretofore followed in the committee's work, Mr Bloomfield announced. "As soon



as this procedural decision has been made and approved, it may be expected that the standards work will be pursued with the same diligence and perseverance as associated with resolving the educational needs," he said.

*There has been a fundamental change* in the home building industry during the past 15 years, said R.J. Johnson, director of research, National Association of Home Builders. Mr Johnson's paper was read for him by Herman York, a trustee of the NAHB Research Institute. Prior to World War II, most new homes were built one at a time for a known customer on a "sold" basis. Today, most new homes are produced from parts—not pieces—for sale to an unknown buyer at a predetermined price, he explained. As a result, today's homes are built faster, with fewer labor hours on the site, less wastage, higher efficiency, and with proportionately more real value than the pre-war house, Mr Johnson said.

The concept of component construction has been a significant contributing factor, he pointed out. A component, being an off-site fabricated part which is modular, may be expected to fit with other parts, produces flexibility in design, and generally serves multiple functions. This has been made possible by the 4-inch module, it was pointed out.

The National Association of Home Builders, which ten years ago joined with the Producers Council, the American Institute of Architects, and the Associated General Contractors of America in a coordinated movement to support and expand the modular building concept, today is contributing 3½ times as much financial support as it did originally. "This clearly demonstrates our belief in modular construction," Mr Johnson commented.

A study of windows made by the NAHB Research Institute resulted in a selection of two widths and five heights of residential windows as standard. Only a short time ago one manufacturer marketed more than 200 sizes of residential steel casement windows, and his sizes did not coincide with anybody else's sizes.

"It costs a builder \$5.00 to \$7.00 an opening to make the house fit the window," Mr Johnson pointed out. "In the typical house this means that non-modular windows cost an extra \$75.00 to \$100.00."

NAHB has now established a research grant for the Massachusetts Institute of Technology to study component construction, particularly dimensional practice, Mr Johnson reported.

"Many modularly dimensioned products are now available and are being used in the home building industry," he pointed out. "More are coming every day. By and large, the big void in non-modular products occurs in kitchen and laundry appliances, glazed wall tile, doors, and flexible floor tile," he said, adding, "To some extent, we must still include windows."

Mr Johnson pointed to standardization work needed immediately as far as home building is concerned.

This includes mechanical equipment and appliances, exterior doors (especially sliding), windows, and standards for the connection and joining systems of the structure itself.

Offering the assistance of the Research Institute of NAHB, Mr Johnson urged manufacturers to develop or redimension their products to conform with modular practices and to take an active role in the standardization work of the Modular Building Standards Association and the American Standards Association.

E.A. Lundberg, president of the Producers' Council, spoke on the producer attitudes towards standards. More progress has been made than is generally realized, Mr Lundberg said. "The Veterans Administration is using the modular principle almost without exception in its hospital building program," he pointed out. "There are more than 700 manufacturers producing modular building materials. A survey by the Association of Collegiate Schools of Architecture indicated that about half of its member schools now include the teaching of modular principles in their courses. About 40 percent of the schools requiring laboratory experience in working drawings also include exercises in modular dimensioning. And, of course, the modular dimensioning text now being prepared will resolve the long-standing need for adequate teaching materials in schools. A survey conducted by a chapter of the American Institute of Architects showed that 85 percent of the architectural firms in the Detroit area that had given modular dimensioning a trial were continuing to use it." There is still plenty of room for improvement, however, Mr Lundberg commented.

Despite the fact that many architects, contractors, and producers are using modular with a record of important savings, and that labor has endorsed its use, inertia and resistance to change are the reasons why the method is not used more widely, Mr Lundberg declared.

*The American Institute of Architects' Building Products Register* was described by Theodore W. Dominick, director of membership services, of AIA. A main objective of the Registry Service is promotion of better product usage, Mr Dominick said. The Registry Service aims to point up the do's and don'ts of product usage, he explained. It makes it possible for the architect, the designer, the specifier to select products freely by direct comparison of technical data in all classifications and grades of products engineered for like usage, Mr Dominick pointed out. AIA also has keyed the data as they relate to standards. Abstracts of the standards are placed immediately behind each product category to which they apply. "The AIA believes firmly in standards as a base for manufactured quality," Mr Dominick declared. "Knowledge of compliance, therefore, is essential to intelligent selection of the proper product to do the job."

## Standards Engineers Society

Speaking on "A general contractor's views on the influence of modular measure and the effects of standards activities," John K. Bowersox, assistant manager, Building Division, Associated General Contractors of America, commented: "Unfortunately, in most cases he [the general contractor] has little to say about the design or the materials that are specified and used in the average building structure." He must "construct 'em as he sees 'em" from the plans and specifications, Mr Bowersox explained. He has much to gain through the use of modular dimensioning, however, Mr Bowersox declared, "Closer cost estimating, quicker job-site layout, reduction of errors due to lack of complicated dimensioning, less waste, and simplified shop drawings are but a few of the advantages that he enjoys under this system."

"We know contractors who eagerly search out modular measure projects in hopes that their competition will not be fully aware of their advantages," Mr Bowersox pointed out. "Under these conditions, they inform us, they have a better chance to be the low bidder by capitalizing upon these proven economies."

Mr Bowersox urged that modular standards be adopted "for the various building components used in our complex structures today." This rests with ASA Sectional Committee A62, he pointed out. "To get every producer and manufacturer of one particular product to agree to a standard set of sizes is not always easy," he said, "but we have confidence that ASA will have the necessary perseverance and patience to see this job through."

### THE COMPLETE RECORD

Only a few of the ideas presented at the Conference could be indicated in this summary. But all of them will be included in the complete report of the meeting, now being published. If you were not able to attend the Conference—or if you were—you will find many helpful suggestions in the **Proceedings of the Eleventh National Conference on Standards**. Copies can be ordered now from ASA, for delivery in January—\$4.50 each.



Norman L. Mochel accepts SES-ASTM award for outstanding service from SES past-president Madhu Gokhale.



Fulton R. Magill was awarded an SES Fellowship. Here, he receives certificate from past-president Herbert Arlt.



David Wolochow of Canada became an SES Fellow at the annual meeting. Herbert Arlt presents the certificate.

## Ninth Annual Meeting

**"STANDARDIZATION APPLIED"** was the theme of the Ninth Annual Meeting of the Standards Engineers Society, held at the Hilton Hotel, Pittsburgh, September 26-28. In addition to technical sessions geared to this theme, awards were presented for service to standardization and to the Society. The Society's highest award of Honorary Life Fellow was presented, in absentia, to James Garfield Morrow, former president of the American Society for Testing Materials and chairman of the Canadian Standards Association from 1936 to 1953. Mr Morrow, who at the time was in charge of standardization in chemical methods, metallurgical processes, and products for The Steel Company of Canada, Ltd, was recipient of ASA's Standards Medal in 1955.

Four members of the Society were awarded fellowships in recognition of their high standing in the standards profession. They are Leslie D. Price, manager of the Engineering and Safety Regulations Department of the National Electrical Manufacturers Association; David Wolochow, secretary of the Canadian Government Specifications Board; Fulton R. Magill, manager of the Central Standards Department, Rockwell Manufacturing Company; and Lal C. Verman, director of the Indian Standards Institution.

Norman L. Mochel received the Standards Engineers Society-American Society for Testing Materials (SES-ASTM) award for outstanding service in standardization. The award includes a \$100 honorarium presented by ASTM. Mr. Mochel is manager of material engineering, Westinghouse Electric Corporation, Philadelphia. He has served as president of ASTM and as chairman of the ASTM Standing Committee on Standards, and is serving on five ASTM committees. He is also a member of the ASTM Ordnance Advisory Committee. Mr Mochel presented the first Gillett Memorial Lecture for ASTM, and has presented the Mehl Honor Lecture on "Standards for Nondestructive Testing Practice." He represents ASTM on ASA Sectional Committee B31, Code for Pressure Piping, and the American Society of Mechanical Engineers on Sectional Committee Z54, Safety Code for the Industrial Use of X-rays.

The Standards Engineers Society-American Society for Testing Materials award for outstanding contributions to the literature of standardization was presented to Alfred C. Webber. This award also carried an honorarium of \$100 presented annually by ASTM. As senior supervisor in the Research and Development Division of the Polychemicals Department at Du Pont's Experimental Station, Mr Webber has initiated, directed, and reported upon studies leading to the development of many of the plastics industry's

standard test methods and specifications. Mr Webber was also cited for his service as chairman of the task group that prepared the "Guide to Writing ASTM Specifications for Plastics," and for encouraging others to contribute to the literature on standardization.

Special Service Citations for outstanding service to the Society were presented to Michael J. McKerrow and to Miss Ruth E. Mason. Mr McKerrow, former chairman of the Hamilton-Toronto Section of SES and at present chairman of the Standing Committee on International Membership, is section engineer with the Electronics Division, Canadian Westinghouse Company, Ltd, Hamilton, Ontario. He was cited for promoting the growth of SES membership in countries outside the U.S. and for helping to pave the way for establishment of the UK Section. "As a result of his efforts, the Society can boast membership in some of the remote areas of this globe," the citation points out. Miss Mason is editor of *THE MAGAZINE OF STANDARDS*, and for several years was chairman of the public relations committee of SES. She was cited for providing "excellent publicity for the Society" through which, the citation declares, "the Society has gained proper recognition in technical circles and has been able to build up to its present stature."

An award was given to Syed Alvi, Raytheon Company, for the best paper on standardization submitted in the Technical Paper Contest. Mr Alvi's article discussed the problems of international standardization.

Papers presented at the meeting discussed the psychological influences of standardization, problems of company standards departments, numbering systems, standards and electronic computers, decimal dimensioning, and MIL drawing specifications.

*Richard G. Munroe*, president of the Society, declared in opening the meeting that standards engineers have not yet succeeded in bringing the concept of standardization to its proper level of activity in support of the free world's economic system.

"It appears to me," Mr Munroe said, "that the peoples of the free world are in the process of redistributing the fruits of their labors. If this process is to continue, and I am convinced that it should and will, a degree of standardization beyond anything we have yet imagined must come into being. Voluntary standardization among the industries of the free world, coupled with agreements to produce certain products exclusively in nations best suited to produce them could well be the decisive weapon in combating communism."

In addition to the knowledge of technical aspects of standardization, a standards engineer must be cognizant of the psychological influences that affect his line of work, said Madhu S. Gokhale. Mr Gokhale, past president of SES, is coordinator of military drafting standards, Radio Corporation of America. He listed 10 factors as important in a standards engineer's work.



The mechanics of preparing a standards manual were outlined by Leslie M. Dalcher, assistant to director of engineering, Fairbanks, Morse & Company.

John W. W. Sullivan, metallurgical engineer, American Iron and Steel Institute, described the national work on steel products standards. He also cited typical examples of ASTM standard specifications, SAE standards, and steel industry practices (as given in the AISI Steel Products Manual) to show current trends in the writing of standards and specifications for steel.

In his talk on better engineering writing, Richard M. Koff, assistant managing editor, *Product Engineering*, declared that the most difficult problems in engineering writing are in attitudes. The basic rules, he said, are: Be simple; be positive; be brave; be personal; be specific; be concise.

Dr Jules Labarthe, professor of textile technology, Carnegie Institute of Technology, described the use and misuse of the new textiles. If there were more general understanding and use of textile standards, many of the difficulties with the new materials could be avoided, Dr Labarthe said. He referred to American Standards L22, which provide performance standards for textile materials regardless of the identity of the fiber but in terms of their end use.

Joseph Mazia, chief engineer, and James V. Panek, project engineer, Vitro Engineering Company, Washington, D.C., analyzed the points considered in designing an integrated corporation coding system. Some of the points he listed were: uniform identification; product and equipment identification where public recognition of the numbers is called for or where more than one division is concerned; compatibility of the different systems; utilization of the unit number principle; number assigned to part used in handbook and other pertinent documents; each use differentiated by prefix letters and suffix numbers, number distinctive so user can easily identify number with document or product.

Companies can ill afford the time required to juggle polyglot numbering systems, G. A. Remely, purchasing research specialist, Westinghouse Electric Corporation, pointed out. He suggested that an effort be made to establish an American Standard system of numbering, then continue to an international system. Mr Remely explained the Westinghouse numbering system in detail.

In his talk on standards in the nonferrous industry, William A. Mader, vice-president for Technical Services, Oberdorfer Foundries and Oswego Castings Division, limited his discussion to aluminum alloy castings.

Mr Mader described how standards and specifications are applied in the various departments of a foundry from receipt of a casting blueprint to shipment of the casting to the customer.

Electronic computers interest standards engineers more as tools than as objects of standardization,

said Andrew J. Pepper, manager, Computer Branch, Koppers Company.

In making use of the computer as a new tool, Mr Pepper commented, the standards group must maintain functional relations with the computer group.

Mr Pepper believes the computer may eventually integrate related standards into groups or systems of standards, that standards may eventually be revised by machine and not by standards engineers, and that the computer may eventually integrate all the functions of the company even to the executives' routines, and compute the hour-by-hour position of the company.

Referring to the history of the decimal, Wayne Stone, manufacturing analysis divisional standards, Lycoming Division of Avco Corporation, pointed out that decimal fractions evolved because of the time consumed in finding ordinary fractions. In his opinion, decimal dimensioning is an integral part of modern industry and technology. SAE was the first technical society to sponsor a complete decimal dimensioning system, he commented. Since then, the use of the system has grown by leaps and bounds. In computer work, he pointed out, now even minutes and seconds of angles must be in decimals.

The present status of MIL-STD-70327 was discussed by W. W. Thomas, manager of drafting administration, RCA Moorestown Missile and Surface Radar Division. Implementation of the standards is not proceeding at the rate contemplated by those who prepared it, he said. In some cases, economy forces the military to side-step, he pointed out. In others, individual practices of the military services have not been adjusted to agree with the standard and each branch warps the standard to agree with its pre-70327 practices.

Mr Thomas urged the standards engineers to be sure of their own attitudes in negotiations and if the military requirement adds to their cost to say so. Think through the entire drafting system, he urged. As you negotiate with each branch, emphasize areas where conflicts exist between the practice and the branch with which you are dealing. Participate in industry efforts to improve 70327.

Mr Thomas pointed out that definition of "proprietary information" is a difficult problem. A reasonable method of differentiation between proprietary and nonproprietary material must be developed, he said.

As the final paper in the technical program, J. E. Ross, assistant principal standards engineer, E. I. du Pont de Nemours & Company, explained the operations of the du Pont standards program and how the results of the program are evaluated.

All the papers are in the Proceedings of the meeting, which has just been published. Copies are \$4 to SES members, \$5 to nonmembers. Requests for Proceedings should be sent to Miss M. M. Hoagland, Advertising Division, Leeds & Northrup Company, 4901 Stenton Avenue, Philadelphia 44, Pa.



# AMERICAN STANDARDS

## GAS-BURNING APPLIANCES

- Addenda Z21.5a-1960 to American Standard Approval Requirements for Domestic Gas Clothes Dryers, Z21.5-1959 \$0.15
- Addenda Z21.10.2a-1960 to American Standard Approval Requirements for Gas Water Heaters, Volume II, Side-Arm Type Water Heaters, Z21.10.2-1959 \$0.50
- Addenda Z21.11a-1960 to American Standard Approval Requirements for Gas-Fired Room Heaters, Z21.11-1959 \$0.25
- Addenda Z21.13.1b-1960 to American Standard Approval Requirements for Central Heating Gas Appliances, Volume I, Steam and Hot Water Boilers, Z21.13.1-1958, Z21.13.1a-1959 \$0.15
- Addenda Z21.15b-1960 to American Standard Listing Requirements for Manually Operated Gas Valves, Z21.15-1958, Z21.15a-1959 \$0.15
- Addenda Z21.17b-1960 to American Standard Listing Requirements for Domestic Gas Conversion Burners, Z21.17-1958, Z21.17a-1959 \$0.15
- Addenda Z21.34b-1960 to American Standard Approval Requirements for Gas-Fired Duct Furnaces, Z21.34-1958, Z21.34a-1959 \$0.50
- Addenda Z21.40a-1960 to American Standard Approval Requirements for Gas-Fired Absorption Summer Air Conditioning Appliances, Z21.40-1959 \$0.25

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## MATERIALS AND TESTING

- Quicklime and Hydrated Lime for Sand-Lime Products, Specification for, ASTM C 415-58T; ASA K67.18-1960 \$0.30
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## PIPE AND FITTINGS

- Addendum B31.1a-1960 to American Standard Code for Pressure Piping, B31.1-1955 \$0.50
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- Addendum B31.4a-1960 to American Standard Oil Transportation Piping, B31.4-1959 \$0.50
- Addendum B31.8a-1960 to American Standard Gas Transmission and Distribution Systems, B31.8-1958 \$0.50
- Sponsor: American Society of Mechanical Engineers
- Copper-Brazed Steel Tubing, Specifications for, ASTM A 254-58; ASA B36.35-1960 (Revision of ASTM A 254-55T; ASA B36.35-1956) \$0.30

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## SAFETY

- Power Lawn Mowers, Safety Specifications for, B71.1-1960 \$1.00
- Safety specifications for power lawn mowers designed for use by the general public. Includes both manually-propelled and self-propelled rotary mowers and self-propelled reel type mowers; specifications for blade enclosure, blade mounting, hardness of the blade, engine safety switch, and wheel-drive controls. Also included are suggestions for safe operation of power lawn mowers by the user.

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Sponsors: Eastern Ski Area Operators Association; American Society of Mechanical Engineers

## In Process . . .

As of November 15, 1960

## ACOUSTICS, VIBRATION, AND MECHANICAL SHOCK

### American Standard Approved

- Electroacoustical Characteristics of Hearing Aids, Methods for Measurement, S3.3-1960 (Revision of Z24.14-1953)
- Sponsor: Acoustical Society of America

### In Standards Board

- General-Purpose Sound Level Meters, Specifications for, S1.4- (Revision of Z24.3-1944)
- Sponsor: Acoustical Society of America

## BUILDING AND CONSTRUCTION

### American Standard Approved

- Installation of Ceramic Tile with Dry-Set Portland Cement Mortar (Including Requirements of Related Divisions), Specifications for, A108.5-1960
- Sponsor: Tile Council of America

### In Standards Board

- Gypsum Plasters, Specification for, ASTM C 28-60; ASA A49.3- (Revision of ASTM C 28-59; ASA A49.3-1959)

Sponsor: American Society for Testing Materials

- Gypsum Wallboard, Specification for, ASTM C 36-60; ASA A69.1- (Revision of ASTM C 36-58; ASA A69.1-1959)

Sponsor: American Society for Testing Materials

- Gypsum and Gypsum Products, Methods of, ASTM C 26-60; ASA A70.1- (Revision of ASTM C 26-59; ASA A70.1-1959)

Sponsor: American Society for Testing Materials

- Sampling and Testing of Brick, Methods of, ASTM C 67-60; ASA A82.1- (Revision of ASTM C 67-57; ASA A82.1-1958)

Sponsor: American Society for Testing Materials

- Sampling and Testing Structural Clay Tile, Methods of, ASTM C 112-60; ASA A83.1- (Revision of ASTM C 112-52; ASA A83.1-1953)

Sponsor: American Society for Testing Materials

- Facing Brick (Solid Masonry Units Made from Clay or Shale), Specification for, ASTM C 216-60; ASA A99.1- (Revision of ASTM C 216-57; ASA A99.1-1958)

Sponsor: American Society for Testing Materials

- Evaluating the Properties of Wood-Base, Fiber- and Particle-Panel Materials, Methods of Test for, ASTM D 1037-60T; ASA O8.1- (Revision of ASTM D 1037-56T; ASA O8.1-1958)

Sponsor: American Society for Testing Materials

### American Standard Withdrawn

- Coal-Tar Pitch for Steep Built-Up Roofs, Specifications for, ASTM D 654-49; ASA A109.7-1955
- Sponsor: American Society for Testing Materials

## CINEMATOGRAPHY

### American Standards Approved

- Cross-Modulation Tests for 16mm Variable-Area Photographic Sound Prints, PH22.52-1960 (Revision of PH22.52-1954)
- Sound Records and Scanning Area of Double Width Push-Pull Sound Prints, Normal Centerline Type, PH22.69-1960 (Revision of PH22.69-1948)
- Sound Records and Scanning Area of Double Width Push-Pull Sound Prints, Offset Centerline Type, PH22.70-1960 (Revision of PH22.70-1948)

Spectral Diffuse Density of Photographic Sound Record on Three-Component Subtractive Color Films, PH22.117-1960

*Sponsor:* Society of Motion Picture and Television Engineers

#### **ELECTRIC AND ELECTRONIC**

##### **American Standards Approved**

Rubber and Thermoplastic Insulated Wire and Cable, Methods of Testing, ASTM D 470-59T; ASA C8.22-1960 (Revision of ASTM D 470-52T; ASA C8.22-1954)

Synthetic Rubber Insulation for Wire and Cable, 60 C Operation, Specification for, ASTM D 755-58; ASA C8.23-1960 (Revision of ASTM D 755-52T; ASA C8.23-1954)

Synthetic Rubber Insulation for Wire and Cable, 75 C Operation, Specification for, ASTM D 754-58; ASA C8.24-1960 (Revision of ASTM D 754-52T; ASA C8.24-1954)

Natural Rubber Sheath for Wire and Cable, Specification for, ASTM D 532-58; ASA C8.25-1960 (Revision of ASTM D 532-49; ASA C8.25-1954)

Natural Rubber Performance Insulation for Wire and Cable, 60 C Operation, Specification for, ASTM D 353-58; ASA C8.26-1960 (Revision of ASTM D 353-52T; ASA C8.26-1954)

Natural Rubber Heat-Resisting Insulation for Wire and Cable, 75 C Operation, Specification for, ASTM D 469-58; ASA C8.27-1960 (Revision of ASTM D 469-52T; ASA C8.27-1954)

Styrene-Butadiene (SBR) Synthetic Rubber Sheath for Wire and Cable, Specification for, ASTM D 866-58; ASA C8.28-1960 (Revision of ASTM D 866-46T; ASA C8.28-1954)

Ozone-Resisting Insulation for Wire and Cable, Specification for, ASTM D 574-59T; ASA C8.29-1960 (Revision of ASTM D 574-46T; ASA C8.29-1954)

General-Purpose Neoprene Sheath for Wire and Cable, Specification for, ASTM D 753-57T; ASA C8.31-1960 (Revision of ASTM D 753-49; ASA C8.31-1954)

Heavy-Duty Black Neoprene Sheath for Wire and Cable, Specification for, ASTM D 752-57T; ASA C8.32-1960 (Revision of ASTM D 752-49T; ASA C8.32-1954)

Ozone-Resisting Butyl Rubber Insulation for Wire and Cable, Specification for, ASTM D 1352-59T; ASA C8.37-1960

Synthetic Rubber Heat- or Moisture-Resisting Insulation for Wire and Cable, Specification for, ASTM D 1520-58T; ASA C8.38-1960

Synthetic Rubber Performance, Moisture Resisting Insulation for Wire and Cable, Specification for, ASTM D 1521-58T; ASA C8.39-1960

Synthetic Rubber Insulation for Wire and Cable, 90 C Operation, Specification for, ASTM D 1523-58T; ASA C8.40-1960

*Sponsor:* Electrical Standards Board

Interrupting Rating Factors for Reclosing Service Power Circuit Breakers, C37.7-1960 (Revision of C37.7-1952)

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##### **In Standards Board**

Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft, Specifications for, ASTM B 8-60; ASA C7.8- (Revision of ASTM B 8-56; ASA C7.8-1957)

Hard-Drawn Aluminum Wire for Electrical Purposes, Specifications for, ASTM B 230-60; ASA C7.20- (Revision of ASTM B 230-55T; ASA C7.20-1956)

Concentric-Lay-Stranded Aluminum Conductors, Hard, Three-Quarter Hard, and Half-Hard, Specifications for, ASTM B 231-60; ASA C7.21- (Revision of ASTM B 231-58; ASA C7.21-1959)

Concentric-Lay-Stranded Aluminum Conductors, Steel-Reinforced (ACSR), Specifications for, ASTM B 232-60; ASA C7.22- (Revision of ASTM B 232-58T; ASA C7.22-1959)

Rolled Aluminum Rods (EC Grade) for Electrical Purposes, Specifications for, ASTM B 233-60; ASA C7.23- (Revision of ASTM B 233-55; ASA C7.23-1957)

Resistivity of Electrical Conductor Materials, Method of Test for, ASTM B 193-60; ASA C7.24- (Revision of ASTM B 193-1958; ASA C7.24-1959)

Standard Weight Zinc-Coated (Galvanized) Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR), Specifications for, ASTM B 245-60; ASA C7.28- (Revision of ASTM B 245-58; ASA C7.28-1959)

Zinc-Coated (Galvanized) Steel Core Wire (with Coatings Heavier than Standard Weight) for Aluminum Conductors, Steel Reinforced (ACSR), Specifications for, ASTM B 261-60; ASA C7.34- (Revision of ASTM B 261-58; ASA C7.34-1959)

Silver-Coated Soft or Annealed Copper Wire, Specifications for, ASTM B 298-60; ASA C7.38- (Revision of ASTM B 298-56T; ASA C7.38-1957)

Copper Conductors for Use in Hookup Wire for Electronic Equipment, Specifications for, ASTM B 386-60; ASA C7.39- (Revision of ASTM B 386-57T; ASA C7.39-1958)

Aluminum Wire for Communication Cable, Specifications for, ASTM B 314-60; ASA C7.40- (Revision of ASTM B 314-57T; ASA C7.40-1958)

Stiffness of Bare Soft Square and Rectangular Copper Wire for Magnet Wire Fabrication, Method of Test for, ASTM B 279-60; ASA C7.41-

Half-Hard Aluminum Wire for Electrical Purposes, Specification for, ASTM B 323-60; ASA C7.42-

Rectangular and Square Bare Aluminum Wire for Electrical Conductors, Specification for, ASTM B 324-60; ASA C7.43-

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Requirements and Terminology for Specialty Transformers, Including Cold-Cathode Lighting Transformers, C89.1- (Revision of C98.1-1957)

*Sponsor:* National Electrical Manufacturers Association

##### **American Standard Reaffirmed**

Rated Control Voltages and their Ranges, for Power Circuit Breakers, C37.8-1952 (R1960)

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##### **Reaffirmation Being Considered**

Medium-Hard-Drawn Copper Wire, Specification for, ASTM B 2-52; ASA C7.3-1953

Hot-Rolled Copper Rods for Electrical Purposes, Specification for, ASTM B 49-52; ASA C7.7-1953

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##### **Withdrawal Being Considered**

Straight and Offset Resistance-Welding Electrodes and Electrode Holders, C52.3-1945

Controls for Resistance-Welding Machines, C52.4-1945

Resistance-Welding Machines, Specifications for, C52.5-1945

#### **GAS-BURNING APPLIANCES**

##### **In Standards Board**

Addenda to American Standard Listing Requirements for Domestic Gas Appliance Pressure Regulators, Z21.18-1956

*Sponsor:* American Gas Association

#### **HIGHWAY TRAFFIC**

##### **In Standards Board**

Method of Recording and Measuring Motor Vehicle Fleet Accident Experience, D15.1-

Method of Recording and Measuring Motor Vehicle Fleet and Passenger Accident Experience, D15.2-

*Sponsors:* National Safety Council; American Trucking Associations

#### **MECHANICAL**

##### **American Standard Approved**

Gaging Practices for Ball and Roller Bearings, B3.4-1960 (Revision of B3.4-1950)

*Sponsor:* Anti-Friction Bearing Manufacturers Association

#### **PETROLEUM PRODUCTS**

##### **AND LUBRICANTS**

##### **In Standards Board**

Cone Penetration of Lubricating Grease, Test for, ASTM D 217-60; ASA Z11.3- (Revision of ASTM D 217-52T; ASA Z11.3-1952)

Water and Sediment in Crude Oils by Centrifuge, Method of Test for, ASTM D 96-60; ASA Z11.8- (Revision of ASTM D 96-59T; ASA Z11.8-1960)

Melting Point of Petrolatum and Microcrystalline Wax, Method of Test for, ASTM D 127-60; ASA Z11.22- (Revision of ASTM D 127-49; ASA Z11.22-1949)

Knock Characteristics of Motor Fuels Below 100 Octane Number by the Motor Method, Method of Test for, ASTM D 357-60; ASA Z11.37- (Revision of ASTM D 357-59; ASA Z11.37-1960)

Unsulfonylated Residue of Petroleum Plant Spray Oils, Method of Test for, ASTM D 483-60T; ASA Z11.41- (Revision of ASTM D 483-52T; ASA Z11.41-1952)

Congelling Point of Petrolatum and Petroleum Waxes, Method of Test for,

ASTM D 938-60; ASA Z11.61- (Revision of ASTM D 938-49; ASA Z11.61-1949)

Knock Characteristics of Motor Fuels Below 100 Octane Number of the Research Method, Method of Test for, ASTM D 908-60; ASA Z11.69- (Revision of ASTM D 908-59; ASA Z11.69-1960)

Olefinic Plus Aromatic Hydrocarbons in Petroleum Distillates, Method of Test for, ASTM D 1019-60T; ASA Z11.71- (Revision of ASTM D 1019-58T; ASA Z11.71-1958)

Rust Preventing Characteristics of Steam-Turbine Oil in the Presence of Water, Test for, ASTM D 665-60; ASA Z11.85- (Revision of ASTM D 665-54; ASA Z11.85-1955)

Kinematic Viscosity, Method of Test for, ASTM D 445-60; ASA Z11.107-

Sulfur in Petroleum Products and LP-Gas (Lamp Method), Method of Test for, ASTM D 1266-59T; ASA Z11.108-

Measuring Color of Petroleum Products, Method of Test for, ASTM D 1500-58T; ASA Z11.109-

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**Reaffirmation Being Considered**

Distillation of Natural Gasoline, Method of Test for, ASTM D 216-54; ASA Z11.11-1955

Burning Quality of Kerosine, Method of Test for, ASTM D 187-49; ASA Z11.17-1949

Burning Quality of Mineral Seal Oil, Method of Test for, ASTM D 239-30; ASA Z11.18-1930

Burning Quality for Long-Time Burning Oil for Railway Use, Method of Test for, ASTM D 219-36; ASA Z11.19-1936

Precipitation Number of Lubricating Oils, Method of Test for, ASTM D 91-52; ASA Z11.30-1952

API Gravity of Petroleum and its Products (Hydrometer Method), Method of Test for, ASTM D 287-55; ASA Z11.31-1955

Distillation of Crude Petroleum, Method of Test for, ASTM D 285-54T; ASA Z11.32-1955

Saybolt Color of Refined Petroleum Products (Saybolt Chromometer Method), Method of Test for, ASTM D 156-53T; ASA Z11.35-1953

Viscosity-Temperature Charts for Liquid Petroleum Products, ASTM D 341-43; ASA Z11.39-1943

Stoddard Solvent, Specifications for, ASTM D 484-52; ASA Z11.42-1952

Calculating Viscosity Index, Method for, ASTM D 567-53; ASA Z11.45-1953

Method for Conversion of Kinematic Viscosity to Saybolt Universal Viscosity, ASTM D 446-53; ASA Z11.46-1953

Carbonizable Substances in White Mineral Oil (Liquid Petrolatum), Method of Test for, ASTM D 565-45; ASA Z11.49-1945

Carbonizable Substances in Paraffin Wax, Method of Test for, ASTM D 612-45; ASA Z11.50-1945

Chemical Analysis for Metals in Lubricating Oils, Methods of, ASTM D 811-48; ASA Z11.56-1949

Density and Specific Gravity of Hydrocarbon Liquids by Lipkin Bicapillary Pycnometer, Method of Test for, ASTM D 941-55; ASA Z11.62-1955

Oxidation Stability of Gasoline (Induction Period Method), Method of Test for, ASTM D 525-55; ASA Z11.63-1955

Interfacial Tension of Oil Against Water by the Ring Method, Test for, ASTM D 971-50; ASA Z11.64-1950

Oxidation Stability of Lubricating Greases by the Oxygen Bomb Method, Test for, ASTM D 942-50; ASA Z11.65-1950

Saponification Number of Petroleum Products (Potentiometric Titration Method), Method of Test for, ASTM D 939-54; ASA Z11.67-1955

Benzene and Toluene by Ultraviolet Spectro-Photometry, Method of Test for, ASTM D 1017-51; ASA Z11.70-1951

Sodium in Lubricating Oils and Lubricating Oil Additives, Method of Test for, ASTM D 1026-51; ASA Z11.73-1951

Separation of Residue from Butadiene, Method of Test for, ASTM D 1023-52; ASA Z11.75-1952

Nonvolatile Residue of Polymerization Grade Butadiene, Method of Test for, ASTM D 1025-52; ASA Z11.76-1952

Acidity of Residue from Distillation of Gasoline and of Petroleum Solvents, Method of Test for, ASTM D 1093-52; ASA Z11.77-1952

Boiling Point Range of Polymerization Grade Butadiene, Method of Test for, ASTM D 1088-53; ASA Z11.80-1953

Specific Gravity of Petroleum and its Products (Hydrometer Method), Method of Test for, ASTM D 1298-55; ASA Z11.84-1955

Aromatic Hydrocarbons in Olefin-Free Gasoline by Silica Gel Adsorption, Method of Test for, ASTM D 936-55; ASA Z11.86-1955

Oxidation Characteristics of Inhibited Steam-Turbine Oils, Method of Test for, ASTM D 943-54; ASA Z11.87-1955

Measurement of Freezing Points of High-Purity Compounds for Evaluation of Purity, Method of Test for, ASTM D 1015-55; ASA Z11.88-1955

Determination of Purity from Freezing Points of High-Purity Compounds, Method of Test for, ASTM D 1016-55; ASA Z11.89-1955

Oxygen in Butadiene Vapors (Manganous Hydroxide Method), Method of Test for, ASTM D 1021-55; ASA Z11.90-1955

Sampling Liquefied Petroleum Gases, Method of, ASTM D 1265-55; ASA Z11.91-1955

Vapor Pressure of Liquefied Petroleum Gases, Method of Test for, ASTM D 1267-55; ASA Z11.92-1955

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#### PHOTOGRAPHY

##### In Standards Board

Photographic Sheet Paper for General Use, Dimensions for, PH1.12- (Revision of PH1.12-1953)

Industrial X-ray Sheet Film (Inch Sizes), Dimensions for, PH1.15- (Revision of PH1.15-1953)

Graphic Arts Sheet Film (Inch and Centimeter Sizes), Dimensions for, PH1.16- (Revision of PH1.16-1953)

16-Millimeter 100-Foot Film Spools for Recording Instruments, Microfilm, and Still-Picture Cameras, Dimensions for, PH1.33- (Revision of Z38.1.52-1951)

16-Millimeter 200-Foot Film Spools for Recording Instruments, Microfilm, and Still-Picture Cameras, Dimensions for, PH1.34- (Revision of Z38.1.53-1951)

35-Millimeter 100-Foot Film Spools for Recording Instruments, Microfilm, and Still-Picture Cameras, Dimensions for, PH1.35- (Revision of Z38.1.54-1951)

70-Millimeter 100-Foot Film Spools for Recording Instruments, Microfilm, and Still-Picture Cameras, Dimensions for, PH1.36- (Revision of Z38.1.55-1951)

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Sensitometric Exposure of Artificial-Light-Type Color Films, Method for, PH2.20-

Sponsor: Photographic Standards Board

Photographic Grade 1-Phenyl-3-Pyrazolidone, Specification for, PH4.136-

Photographic Grade Sodium Thiosulfate, Anhydrous (Anhydrous Hypo), Specification for, PH4.250- (Revision of PH4.250-1953)

Photographic Grade Sodium Thiosulfate, Crystalline (Crystal Hypo), Specification for, PH4.251- (Revision of PH4.251-1953)

Photographic Grade Ammonium Thiosulfate Solution (Ammonium Hypo Solution), Specification for, PH4.252- (Revision of PH4.252-1953)

Photographic Grade Ammonium Thiosulfate (Ammonium Hypo), Specification for, PH4.253- (Revision of PH4.253-1953)

Photographic Grade Sodium Bisulfite, Anhydrous (Sodium Bisulfite, Anhydrous (Sodium Metabisulfite), Specification for, PH4.276- (Revision of PH4.276-1958)

Sponsor: Photographic Standards Board

Micro-Opacques, Specifications for, PH5.5-

Sponsor: American Library Association

#### SAFETY

##### American Standards Approved

Safety Requirements for Storage and Handling of Anhydrous Ammonia, K61.1-1960

Sponsor: Compressed Gas Association

Maximal Acceptable Concentration of Benzene, Z37.4- (Revision of Z37.4-1941)

Maximal Acceptable Concentration of Xylene, Z37.10- (Revision of Z37.10-1948)

Maximal Acceptable Concentration of Toluene, Z37.12- (Revision of Z37.12-1943)

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